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THE STATE HISTORICAL SOCIETY OF WISCONSIN

I

THE STORY OF ITS GROWTH

II

OPINIONS OF MEN OF LETTERS

III

DESCRIPTION OF THE NEW BUILDING

By REUBEN G. THWAITES

Secretary and Superintendent

1898

DEMOCRAT PRINTING COMPANY
State Printer

comprised one from each county in the State. Increase A. Lap-
ham, a distinguished scientist and antiquarian, was elected sec-
retary, but he was able to give no time to the work. Public
addresses were given before the Society in 1849, 1850, and 1851,
by prominent citizens of the State; but beyond these, nothing
of importance was done during this period. The pamphlet dis-
courses were sent out to perhaps a dozen other learned societies,
and a library of fifty volumes was slowly accumulated — the col-
lection comprising State laws, legislative journals, miscellaneous
public documents, two volumes of the *Transactions of the Amer-
ican Ethnological Society*, and a volume of American bibliog-
raphy. The meagre collection was contained in a small glass-
faced case, kept on a table in a corner of the governor's office,
and this case is now exhibited as a curiosity in the Society's
museum.

It was evident that at this rate of progress, the Society would
never amount to anything. Somebody must devote his entire
Secretary Draper time to the work, becoming personally respon-
sible for the conduct of the Society's affairs,
and giving to it life and character.

The man for the place was
imported to Madison in October, 1852. He was Lyman C.
Draper of Philadelphia, who had already spent about fifteen
years in the accumulation of materials for the history of the
Middle West and the South, achieving such success in that
field, at a time when collectors of Americana were few, as
to attract the attention of Sparks, Bancroft, and other schol-
ars throughout the Eastern States. Draper was then thirty-
seven years of age, full of vigor and push, kindly of disposi-
tion, persuasive in argument, devoted to his life task of collect-
ing, self-denying in the cause, and of unimpeachable character.

For various reasons, not necessary here to recite, it was Janu-
ary 18, 1854, before the Society was thoroughly reorganized for
Reorganization, work on the new plan. Draper was at that
time chosen secretary, and at once entered with

joyous enthusiasm upon the undertaking of accumulating books
for the library, relics and curiosities for the museum, portraits
for the gallery, and documents for publication in the *Wisconsin
Historical Collections*. In the course of a few weeks, the little



LYMAN C. DRAPER, LL. D.

Secretary of the Society, 1854-86. Born Sept. 4, 1815; died Aug. 26, 1891.

library case was too small. By the close of the year, the secretary was able to report to the Society the acquisition of a thousand bound volumes and a thousand pamphlets and documents—certainly a remarkable showing, compared with the fifty books which had been the product of the five years preceding his administration. For want of library space, the

In the Baptist greater part of the acquisitions were stored in church.

Draper's residence until August, 1855, when a small room in the corner of the basement of the local Baptist church was secured for the Society's use. On the first of January, 1856, Daniel S. Durrie, a local bookseller, formerly in business at Albany, N. Y., was chosen librarian, and held this position—as the secretary's lieutenant—for over thirty-six years, until his death, August 30, 1892. He was succeeded by Isaac S. Bradley, for seventeen years his chief assistant, and still the librarian and assistant superintendent of the Society.

The Society soon securing legislative aid, the collections grew rapidly, until nearly the entire basement of the church was occupied. This place was, however, dark, damp, and dingy, and in no way suited to library purposes. In January, 1866, the institution—library, portrait gallery, and museum—was, by the authority of the legislature, removed to quarters especially prepared for it in the then new south wing of the capitol. It was thought that there was now ample room for the accessions of at least a quarter of a century. But such was the rate of increase, that in less than ten years' time these quarters were too small. By the year 1881, cords of volumes, pamphlets, and relics were piled in out-of-the-way corners and rooms throughout the capitol, there being no space to shelve or display them.

Secretary Draper, as the executive officer of the Society, now opened a vigorous campaign for a new building; he awakened interest in many of the leading men of the State, and won the unanimous support of the newspaper editors, who have always been staunch supporters of the Society. But there were certain complications which made it impossible then to carry a separate-building scheme through the legislature. A compromise resulted in the Society being given the second, third, and fourth

floors of one (the southern) of two large transverse wings ordered by the legislature of 1881 to be attached to the capitol.

In December, 1884, the transfer was made to the new and greatly-enlarged quarters — the library occupying the second and third floors of the wing, and the museum south wing. and portrait gallery the fourth. These several floors are reached by a passenger elevator. Having seen the Society established in its new rooms, Secretary Draper resigned his position on the sixth of January, 1887, with a record of thirty-three years of arduous labor in behalf of the State; he was succeeded by the present writer, who had during two years previous been the assistant secretary.

It had been Dr. Draper's desire to devote the remainder of his life to forwarding some private literary work, but he was prevented by ill-health from accomplishing his long-cherished plans in this direction, and died on the twenty-sixth of August, 1891. The Society's library, which he practically founded, and so successfully managed and purveyed for through a third of a century, will remain an enduring monument to his tireless energy as a collector of Americana; the first ten volumes of *Wisconsin Historical Collections* attest his quality as an editor of material for the study of Western history;¹ while his bequest to the Society of his splendid private collection of manuscripts (now bound into 400 folio volumes), for the original study of the frontier history of the South and the Middle West, has made his memory permanently secure among specialists in this large field of historical research.

From the first, the Wisconsin legislature, with enlightened liberality, looked kindly on the undertaking, and made appropriations with which to purchase accessions, meet the greater part of the running expenses, and pay the salaries of secretary and librarian, and one of the assistants. The relationship of the Society to the State is not generally understood, even in Wisconsin. It is, however, easy of comprehension. By statute, the Society—which operates under

¹ See *Wis. Hist. Colls.*, xii, pp. 1-22, for a memoir of Dr. Draper.

a legislative charter granted in 1853—is the trustee of the State, and holds all of its property for the commonwealth. It can neither sell nor give away any of the property it thus holds in trust, nor permanently remove any of it from the capitol,—or from its new building, when it removes thither,—without special consent of the legislature. As to rooms, lights, fires, janitorial service, repairs, mechanical supplies, stationery, printing, and postage, the Society is on much the same footing as any of the State bureaus. The machinery of the Society serves to remove the management of this enterprise from partisan control; the members are gentlemen of prominence throughout the State, of all shades of political opinion, and there has never been even a suspicion of “politics” in the conduct of its affairs. The State Historical Society is an institution which all good citizens unite in declaring should be free from such baneful influences. The work is thus left in the hands of those having a keen interest in it, and trained to its performance. As for the official interests of the commonwealth, they are looked after by the governor, secretary of state, and state treasurer, who are by law *ex officio* members of the executive committee. The fact that these officers have the power to report upon the Society’s operations, and the further fact that the legislature can at any time investigate its affairs, would of itself tend to make the management scrupulously careful,—although the Society needs no incentive of this sort, to do its duty by the people of the State.

The Society is actively engaged in several departments of historical and economic research and collection; has a fairly-equipped historical and ethnographical museum; Society’s work. and a portrait gallery of Wisconsin worthies, containing about 200 portraits in oil, about a hundred crayons, and numerous pieces of portrait statuary. About 50,000 persons visit the gallery and museum annually, the three large halls devoted to these departments being possibly the best patronized exhibition rooms in the State; when removed to the new building, and with ample funds to equip the museum, it is anticipated that the annual attendance will be far greater than now.

Yet, whatever reputation the Society may have won among

charts, old editions of the classics, early lexicons, and historical works. These old Dutch books are among the most precious of our treasures.

The principal daily and weekly newspapers of the State, some 340 in number, are sent gratis to the library, by their publishers, for binding and preservation. About 250 Newspaper files. volumes are annually made up in this manner, three years of the smaller weeklies being bound in a volume. These files generally reach back to the first issues of the journals represented. We find that the State papers are frequently referred to by judges, lawyers, members of the legislature, and special investigators of every sort; while, as the Society's files are in many cases the only full ones in existence, editors themselves have not seldom had occasion to examine them in the library, or to write for data contained in early issues. Our collection of bound newspaper files published outside the State, amounts to nearly 8,000 volumes. The earliest London file is that of the *Public Intelligencer*, bearing date 1656. From that time on, there are few years not represented by some prominent English or American journal. From 1750 forward, the collection is unusually strong, especially in the American department. Newspapers are an important and fertile source of historical information; this feature of the library we regard as of the utmost practical importance. An elaborate catalogue of our newspaper files is now in press.

Regarding the scope of the Society's library, it may be necessary to explain that it is a general reference library, with The scope of the Library. the departments of American and English history, economics, politics, sociology, travels, and geography developed with especial care. On account of the proximity of the University of Wisconsin,—now a mile away, but a next-door neighbor to the new building,—about ninety per cent of our readers are members of that institution, and in purveying for our library their wants are taken into consideration. University students doing original work of some importance, are, under certain restrictions, allowed access to our shelves, the same as other special investigators, as it is greatly

to their advantage to have in sight all the resources of the library on a given subject. To be as useful as possible, is the aim of the library, and the attendants are instructed to grant to deserving students whatever privileges are consistent with careful management. The University history seminars, and some special classes in that line of work, are given the use of rooms adjoining the library. The students and professors are, in fact, encouraged to use our library as freely as they would that of the University itself. The University has a well-selected and competently-managed library of some 40,000 volumes, especially strong in science, classics, modern languages, and belles lettres, and duplication of books already in the State Historical Library is avoided so far as possible; advanced students in history, economics, and kindred subjects rely chiefly upon the latter, as their literary laboratory.

In addition to the University students, specialists from all parts of the West may be found in the State Historical Library, especially in the summer months. During the past year, historical investigators from several of the Atlantic States, North and South, have sought our shelves chiefly to consult our newspaper files, our large genealogical department, and our manuscript collection,—the last-named now embracing nearly 600 stout folio volumes. These are particularly rich in material for the history of the Middle West and the South during the Revolutionary War and the War of 1812-15, for the history of the fur trade in the Old Northwest, and for Wisconsin in detail. There are few reference libraries in the United States, where the range of reading is so broad as in ours.

The legislature has certainly been generous to the Society; with a few notable exceptions, in earlier years, the latter's relations with the governing body have been harmonious; and it must be confessed that the Society could not have been successfully maintained in this State, without liberal official aid — far removed, as it is, from the intellectual centres of the nation, and thereby laboring under peculiar difficulties.

The great need of the Society has long been a commodious,

fire-proof building, designed and equipped upon the most improved models, for the accommodation of its library and museum, and its several offices. The new building. The present quarters in the capitol are quite inadequate in extent, badly constructed in every way, and in no sense fire-proof; moreover, the State government needs for the use of legislative clerks and committees the space occupied by the Society. After many years of agitation, the legislatures of 1895 and 1897 came liberally to the rescue, with tax levies which in due time will aggregate \$420,000. The desired building is at last in course of erection, upon an ample plot of ground given for the purpose by the board of regents of the State University, in the proximity of that institution. It is anticipated that the removal into this building—to occur, probably, during the closing months of 1899—will be accompanied by considerable private gifts to the library and museum, and a general broadening of the Society's influence and usefulness.

The legislature of 1897 also provided for the incorporation of local historical societies, which shall be auxiliary to the parent Auxiliary Society. These local organizations will each be societies. entitled to one representative at the annual meetings of the State Society, and may make reports to the latter, to be published in its *Proceedings*. It is possible that an outgrowth of this union may be occasional historical conventions, held at representative points, at which papers may be presented and other appropriate exercises held. As a general result, the prospect is encouraging within our State, for a considerable growth of popular interest in historical study, which will find its best fruits in the public schools, with whose teachers the Society is desirous of keeping in close touch.

OPINIONS OF MEN OF LETTERS.

We believe that the people of Wisconsin appreciate the work of the State Historical Society, and understand its value as a factor in the higher educational work of the commonwealth. But the fact that the Society has won a high reputation among American scholars at large, is not as well known in our State as it should be. There are few American historical specialists of note, who are not familiar, either by use or by reputation, with the Society's library; but it is thought that the few extracts given below, selected at random from recent comments, are sufficiently representative to indicate the drift of sentiment among experts, concerning an institution which has, in its forty-five years of growth, brought rare honor to Wisconsin.

The *Atlantic Monthly* for February, 1898 (vol. lxxxi, pp. 274, 275), in an editorial, "A Brief Survey of Recent Historical Work," speaks of "The dignified position some of the state societies have attained. * * * The Massachusetts society, the oldest of all, and long the most active, is finding its premiership challenged by the comparatively youthful Wisconsin society, whose library is a workshop for the scholars of the Northwest."

From James B. Angell, LL. D., minister to Turkey, president of the University of Michigan, and ex-president of the American Historical Association: "The great value of your library is known to all historical scholars in the country, and as I have walked through its well-stored alcoves I have felt a shudder of solicitude at such invaluable treasures being so exposed to peril from fire. It really would be an irreparable disaster, not only to Wisconsin, but to the whole country, if your library should be destroyed by fire."

From Dr. Daniel G. Brinton, of Philadelphia, president of the American Association for the Advancement of Science, and author of *The American Race*, *Essays of an Americanist*, *The Language of Paleolithic Man*, *Rig-Veda Americanus*, etc.: "When in Madison in 1893, attending the meeting of the American Association for the Advancement of Science, I visited the rooms and looked over the library of your Society. Before my visit I was familiar with its publications. They have always ranked among the very best issued by any State Historical Society in our country; and the legislature of your State cannot make a wiser appropriation of public funds than to provide all needed facilities for the continuance of the excellent work done by your Society."

From Hon. Melvil Dewey, director of the New York State Library, and ex-president and now secretary of the American Library Association, — one of the foremost library experts in America: "Wisconsin has always occupied a foremost position in the great Northwest, and its great University is now marked by the rapidity with which it is taking a leading place among American institutions of learning. The work of your Historical Society has been universally recognized as of the highest value; but librarians have long wondered that a State so generous to education and letters should [have so long] run the terrible risk of storing your great library in anything but a thoroughly fire-proof building. * * * Every librarian or scholar the world over feels a personal interest in seeing your splendid collections safely housed."

Hon. Samuel A. Green, librarian of the Massachusetts Historical Society, and author of numerous works on New England history, says: "Your collection of books, etc., is simply invaluable to Wisconsin in particular, and to the great Northwest in general; and the influence of the work done by your members is felt throughout the country."

From William R. Harper, LL.D., president of the University of Chicago: "The library of the Wisconsin State Historical Society is one of the best things that have been done for scholarship in the West. Its admirable selection of material makes it rank with the very few really great libraries of America."

From Albert Bushnell Hart, Ph.D., professor of American History in Harvard University, editor of "Epochs of American History" series, and author of *Formation of the Union*, etc.: "The library of the State Historical Society is recognized by scholars throughout the country as being one of the best and most valuable in the West. It is indispensable for every student of the growth and development of the Western states, and that subject is one which is more and more coming to be recognized as an essential in the study of the history of the United States."

From Col. Reuben T. Durrett, of Louisville, president of the Filson Club, and author of numerous works on Kentucky history, in which field he is without doubt the leading authority: "I regard the collection of books and specimens belonging to [your] Society as among the best in the land. A few years ago, while I was in Madison, I had access to this collection, and shall always remember how adequately they met my historical and archaeological investigations."

From Dr. Edward Eggleston, of New York, author of *A History of the United States and its People*, *The Hoosier Schoolmaster*, etc.: "How it has come about that your library is so much richer than others of the kind I do not know, but the fame of your rare collections has even reached Europe. Your library is one of the glories of the country, and in the eyes of scholars it is the greatest glory of Wisconsin."

From Col. Thomas W. Higginson, of Cambridge, Mass., military and naval historian of Massachusetts, and author of a *History of the United*

States and many other historical works: "Every historical student in this country recognizes the great services already rendered by the Wisconsin Historical Society, and will rejoice to hear that they are to be further facilitated by the possession of a proper building."

From Hon. Theodore Roosevelt, assistant secretary of the navy, and author of *Winning of the West*, and many other historical works: "I can conscientiously say that I don't think that in the entire country there is a single historical society which has done better work for American history than yours, and but one or two can rank with it at all. Every American scholar, and in particular every American historian, is under a debt to your Society, and a debt to the State of Wisconsin, for having kept it up."

From Woodrow Wilson, Ph. D., professor of jurisprudence in Princeton University, and author of *Division and Reunion*, *Congressional Government*, *The State*, etc.: "I have had several opportunities of becoming acquainted with the unique character of the collection of books, manuscripts, and pamphlets relating to American history possessed by the Wisconsin Historical Society; and I have no hesitation in saying that its loss or impairment would be nothing less than a national calamity, so far as the scholarship of the country is concerned."

From William P. Trent, Ph. D., professor of history in the University of the South, Sewanee, Tenn., and author of *William Gilmore Simms* ("American Men of Letters" series), etc.: "You rank with the Massachusetts Society as a model of all that a true historical society should be. I know of nothing that the State of Wisconsin has more cause to be proud of than your Society, and any other state or country ought to be proud of it."

From Hon. F. G. Adams, secretary of the Kansas State Historical Society, which ranks next to Wisconsin among the Western societies: "The library of your Society is unsurpassed by any in its collections of original materials of history and of rare books of history, science, the arts, sociology, politics, etc. It has been my pleasure to visit your rooms many times during the past seventeen years. Yours is the model historical library of the country."

From Hon. Richard A. Brock, secretary of the Southern Historical Society, and editor of the *Southern Historical Society Papers* — a leading authority on Virginia history: "The noble library which the Wisconsin Historical Society has been the means of accumulating would be a pre-eminent distinction to any State in the Union. The publications of the Society have, too, most usefully contributed to our country's history. They are held in high regard by students."

Gen. Charles W. Darling, secretary of the Oneida Historical Society (Utica, N. Y.), the author of numerous historical papers, and an authority on New York history: "The State Historical Society of Wisconsin is certainly doing very valuable work in connection with historical matters, not only in the State of Wisconsin, but also in every State in the Union."

From Hon. George F. Hoar, of Worcester, Mass., U. S. senator, and well known as an historical writer: "I have never had an opportunity to visit your library. But I have heard much of its treasures. They will grow in value and estimation as the years go by. * * * You have some treasures for which New England collectors would almost give their eyes."

From J. N. Larned, Esq., of Buffalo, N. Y., ex-president of the American Library Association, and editor of *History for Ready Reference*: "Wisconsin is very fortunate if it has another institution which it may feel proud of as reasonably as of the library of its State Historical Society, and which has equal claims upon its interest and care. Such a collection of the fundamental material of American history,—in some respects the most important in the United States, and ranking in all respects with the two or three greatest historical libraries of the country,—imposes upon the State a serious obligation and duty, not merely to itself, but to the nation at large. The remarkable treasure of manuscripts and books, so laboriously and ably collected at Madison, ought not to be regarded as a Wisconsin possession alone, but held in trust for America; and the trust is assuredly one which confers great honor on the State."

From Dr. William Henry Egle, state librarian of Pennsylvania, and author of several standard works on the history of that State: "Of all the State historical societies, the collection of Wisconsin is one of the most valuable, and it would be a serious loss to historic and literary culture if it should ever be destroyed. From what I know of it from others, the collection has been greatly appreciated by scholars in different parts of the Union."

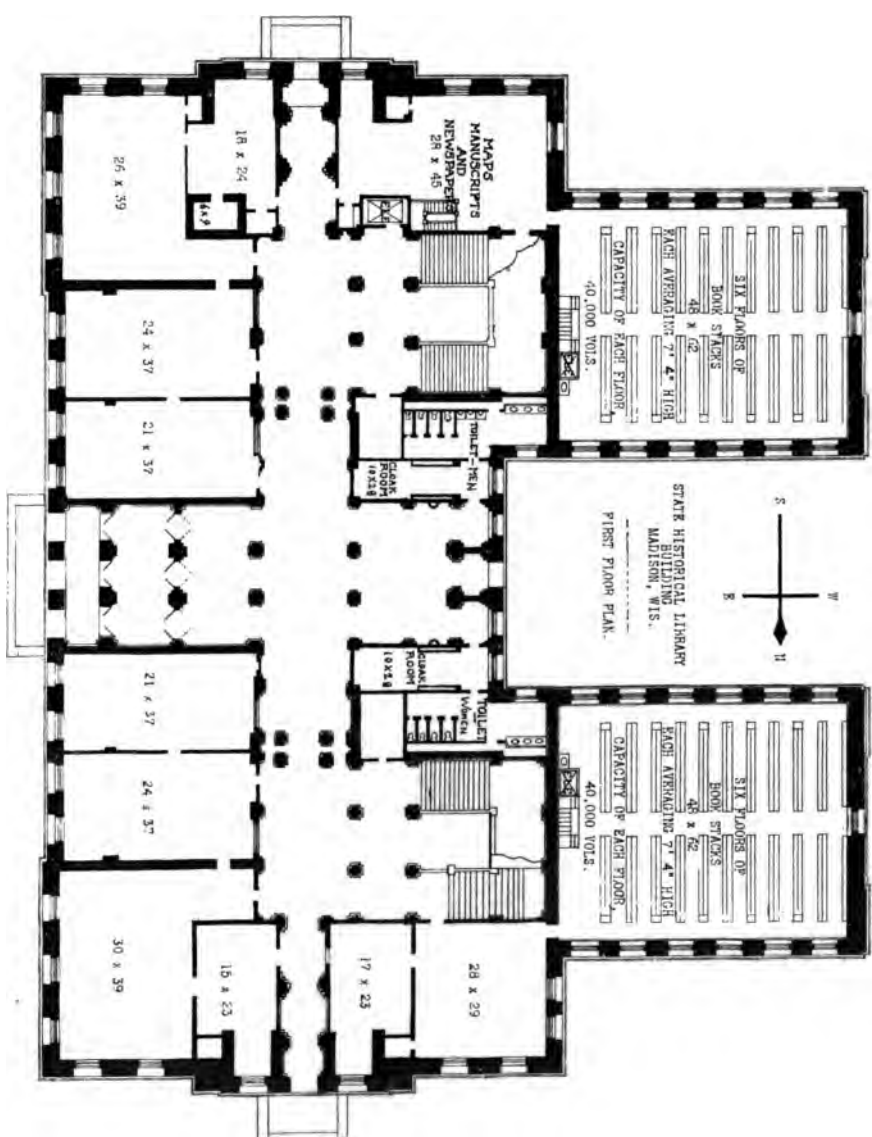
DESCRIPTION OF THE NEW BUILDING.

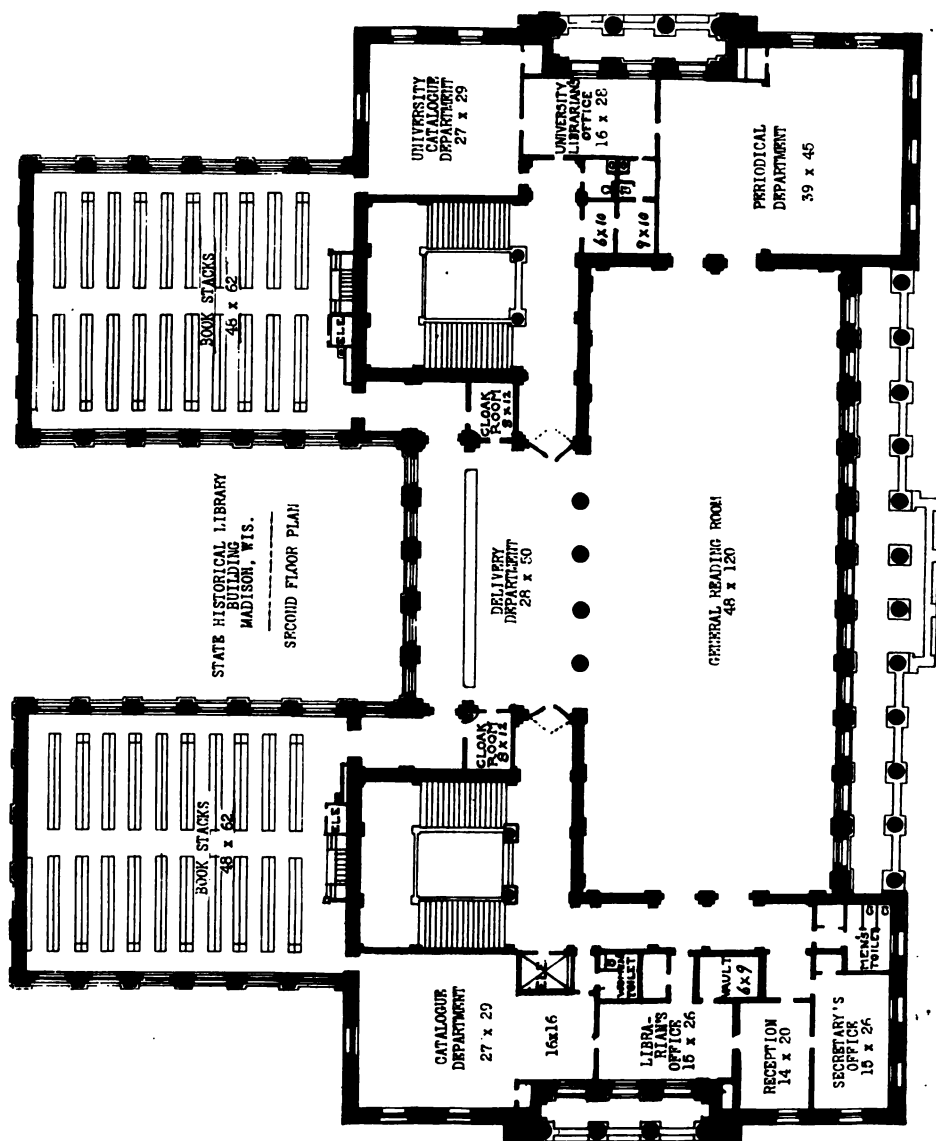
The new home of the Society, provided by the generosity of the legislatures of 1895 and 1897, is now being erected upon a

The site. rising plot of ground (eight city lots) at the west end of what is known as the "lower campus" of the University of Wisconsin. This plot, which is 264 feet square, fronting on State, Langdon, and Park streets, was deeded to the State for the purpose, by the board of University regents. The University library will be assigned quarters within the building.

The principal façade is on the east, facing the lower campus and the city. Probably the best and most familiar view of the structure will be from the southeast, on State street—the point of view of the architects' perspective, in our cut. Although the principal entrance is on the east façade, there will be side entrances on State and Langdon streets, with a campus entrance in the rear on Park street (between the book-stack wings), for the convenience of persons approaching the building from Science Hall or "the hill." The situation is commanding,—it will be noticed from the picture, that as the ground slopes upward to the west (rear), a high, balconied terrace is rendered necessary on the east side,—and the outlook from the main reading room (behind the front colonnade, in the picture) will be an attractive roof-view of the neighborhood, with pretty glimpses of Lake Mendota, dissected by the University Gymnasium and neighboring residences; from the roof, there will be visible a wide sweep of land and water,—for it will be about on a level with the eaves of Science Hall.

The building (Ferry & Clas, architects, Milwaukee) is being constructed of Buff Bedford limestone (from Bedford, Ind.). The A librarians' architecture is of the Ionic order, in the Renaissance style, and in some points resembles, though less elaborate than, Milwaukee's Public Library and Museum build-





ing, by the same architects. While the exterior of the structure is distinctly the work of the architects, the interior arrangement—as is proper, for this is a librarians' workshop—is in almost all particulars the plan of those who are to occupy it; their wishes—based on experience, on the peculiar needs of our institution, and on wide observation and study of other great reference libraries in this country and abroad—have been faithfully observed by the architects, and it is believed that the building, when completed, will be as nearly perfect as is practicable.

Approaching the main (east) portal, the visitor will ascend the terrace stairs (about six feet high), and enter one of the three arches in the center, into an outer vestibule; then an inner vestibule, which opens into the great corridors. Toilet and cloak rooms flank the rear (Park street) entrance; to the right of these, will be stairs leading up to the offices of the University library, and the reading room; to the left, will be stairs leading to the Society's offices and the reading room—also, the public passenger elevator. Still on the left (State street) side of the building will be found, flanking the State-street entrance, the rooms devoted to the consultation and partial storage of bound and current newspaper files, maps, and manuscripts. The other rooms on this first floor, whose dimensions only are given on our plans, will be devoted to various uses,—one to the consultation of Patent Office reports, and some to seminars, where advanced students can, in certain lines of investigation, under direct guidance of their instructors, use special libraries stored there, and study and rendezvous.

Beneath the grand south stairway, a flight descends to the basement, where bicycles can be stored while the owners are within the building; this room, one for each sex, is beneath the book-stack, and is approached from State street by a special run-way, down which freight for the Historical Society will also be carried. The greater part of the basement—which is also approached by another run-way on the north side, and another flight of steps beneath the grand north stairway—will be devoted to the storage of

bound newspaper files, duplicate books and pamphlets, State documents carried in bulk by the Society for exchange purposes, packing and unpacking rooms for both Society and University libraries, janitors' repair shop, electric fan, etc. In each book-stack, an electric service elevator will ascend from the basement to all floors of the building. Heat will be obtained from the University's central heating plant, a tunnel from which runs (to the Gymnasium) along the Park-street (north) front; it is tapped for the library building, under the Park-street entrance.

The visitor who has ridden in the elevator, or ascended the south stairway, to the second floor will find, when facing east-ward, that ahead of him is the corridor leading to the offices and principal work-rooms of the Society. If he wishes to see the secretary and superintendent, the librarian, or any member of the staff, he will proceed to the reception room, from which the person sought will be communicated with by telephone or by electric bell,—both systems will be in use throughout every part of the building. The office of the secretary and superintendent is to the left of the reception room, in the southeast corner; that of the librarian and assistant superintendent, to the right, opening upon the State-street colonnade. Beyond the latter's office is a large, well-lighted room, where new books will be accessioned, classified, and catalogued,—as in other large libraries, this room will not be accessible to the general public, for quiet, rapid work is here necessary, and distractions must be avoided.

When ready for the shelves, the books will be run out on a truck to the adjoining book-stack, and be dispatched by the service elevator to the particular floor to which they have been assigned. There are six stories of the stack, each about 7 ft. 4 in. high, to be fitted with steel book-shelves of the latest design; a continuous stairway will, in addition to the elevator, connect each floor with its fellows. Each floor of the stack will shelve 40,000 volumes,—thus each stack-wing will have a capacity of 240,000, or 480,000 in both; adding the books in the reading room, the periodical department, the libraries of the seminars, and that of the Wisconsin Acad-

emy of Sciences, Arts, and Letters, the normal capacity of the building will be about 550,000 volumes. Upon every floor will be desks and tables for the use of specialists and advanced students, who have received permission to go to the shelves; it will be noticed that each alternate case is shortened, to make room for a small desk at the end.

In connection with the Society's offices, toilet rooms are placed for the convenience of the staff. In this connection it will be noticed that upon each stack floor will be a stationary wash-basin, and each floor of the building is abundantly provided with toilet conveniences for both public and staff.

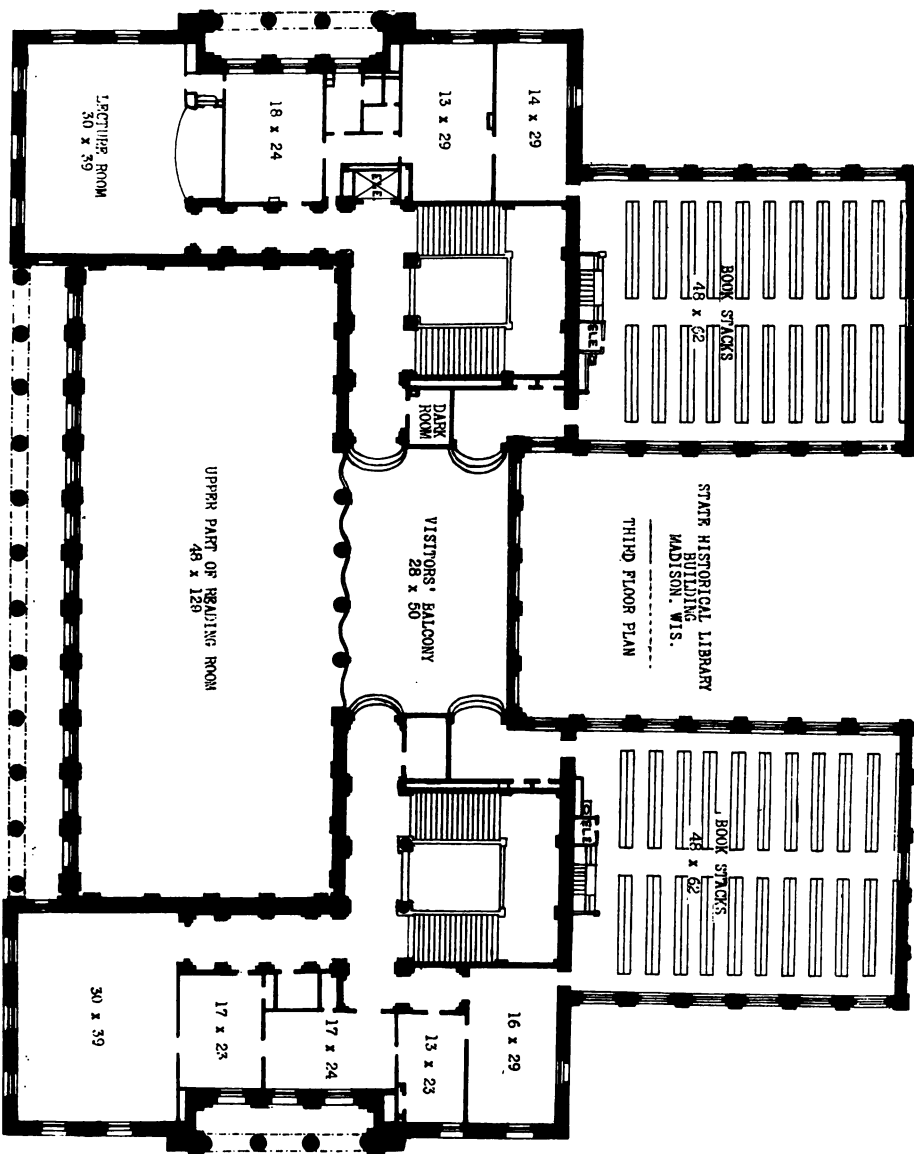
Should the visitor to the second floor seek the reading room, he will approach it through double-swing doors. Immediately upon entrance, will be seen the delivery department, separated from the reading room by four pillars; at the delivery desk, the chief attendant, to whom will be made applications for books stored in the stacks, will be assisted by boy messengers. A cloak room at either end, will be used by those who have failed to leave their wraps below,—for it will not be permissible to encumber the seats with clothing. Near by, will be the public card catalogue. The large hall itself, capable of seating 250 readers, will be equipped with tables and comfortable chairs, electric reading lamps, and all the modern improvements; around the walls, free of access to readers, will be shelved some 6,000 selected reference books, covering all the principal branches of knowledge. In the periodical room, in the north-east corner, will be kept those periodicals, both current and bound, which are included in *Poole's Index*. In one of the arches between the reading room and the periodical room, will be stationed an "information desk," in charge of a member of the staff who is competent to guide all enquirers to the best sources of information on any given subject; this is an important office in every large reference library. Returning to the reading room, it will be seen that the great hall extends up through two stories of the building (it is 30 feet high); that it is lighted not only by the great bank of windows fronting upon the colonnade, but by ample skylights in

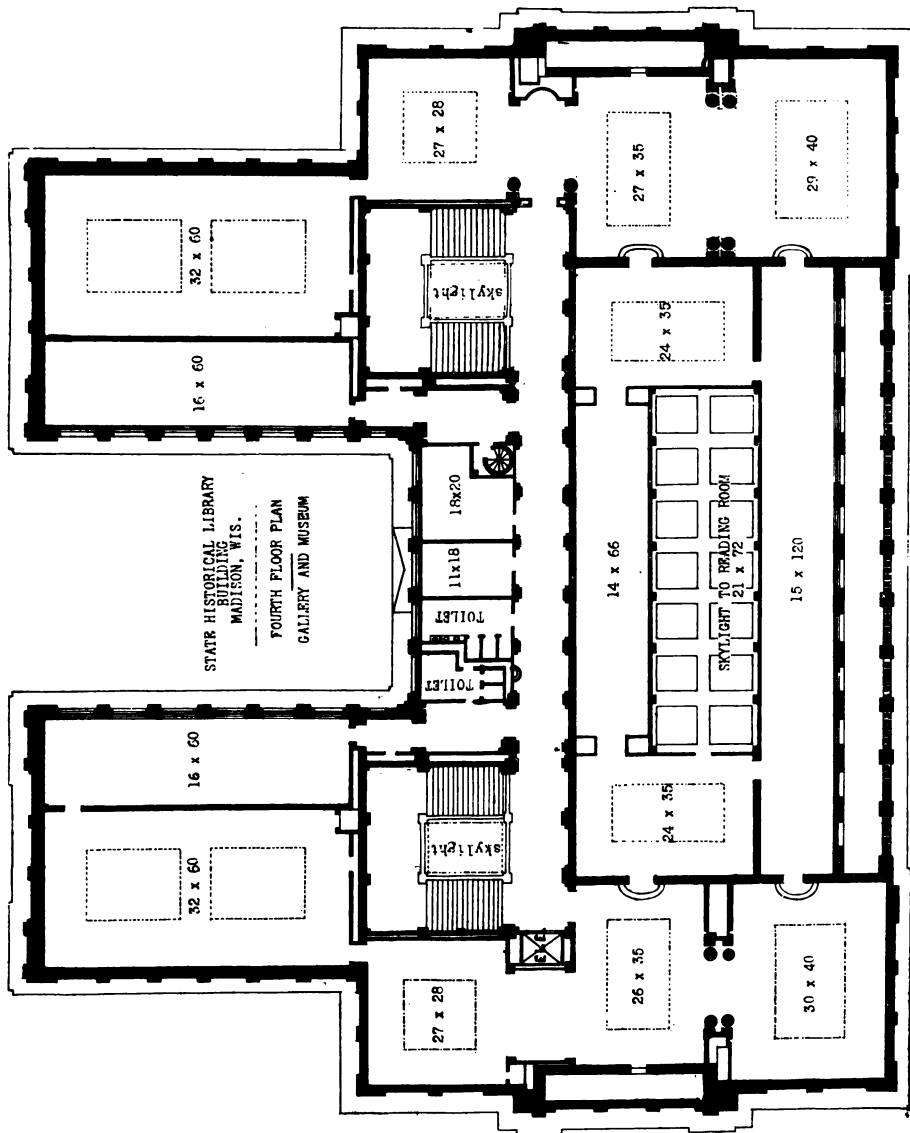
the museum floor overhead; and that over the delivery department there is a gallery for the accommodation of visitors.

Leaving the reading room by the north entrance, one finds himself opposite the official quarters of the University library, to which certain floors in the north book-stack will also be assigned.

As will be seen upon reference to the plan, a large part of the third floor is occupied by the upper part of the reading room, and the visitors' balcony. The rooms upon the north side will doubtless be utilized for seminars. Those upon the south side, will be needed for the various purposes of the Society. The lecture hall, which will seat about 250 persons, will be in use for meetings of the Society, the Academy of Sciences, and such other State associations as may need it, — e. g., the Wisconsin Press Association; it will be so equipped that it can readily be darkened at any hour, for stereopticon lectures, and will also be so arranged that, when desired, art exhibits may here be held. Toilet rooms adjoin; and in the rear of these are rooms which are chiefly intended for the use of those of the Society's staff who are engaged in preparing publications for the press, proof-reading, and official research-work — it will be seen that these rooms are immediately connected with the book-stack. A dark-room for photographers, is another feature of this floor.

Possibly the fourth floor will chiefly interest the largest number of the general public; for here will be quartered the museum Gallery and portrait gallery. It will be seen that most ample arrangements have been made for the accommodation of the Society's treasures in these departments. Two public stairways lead to this floor; also, a large electric passenger elevator. There will be toilet rooms for both sexes, work-room and store room for the janitor and cleaners, and a series of galleries and cabinet rooms which so open one into another as at every turn to present pleasing vistas which will admit of thoroughly artistic treatment. It will be noticed that the galleries are illuminated by central skylights; while the cabinet rooms receive light from side windows opening either upon the west court, or upon a promenade back of the topmost railing (just above the reading-room colonnade).





It is anticipated by the Society that when the removal to the new building takes place, the gallery and museum will at once receive important gifts of exhibits and of money,—such is the experience of similar institutions elsewhere. It is the intention of the Society to make its new rooms far more attractive than has been possible in the present quarters; and the State University has like aspirations for the rooms upon this floor which they hope to occupy with works of art. With the University's natural history and geological museums across the way, in Science Hall; with the University's art gallery properly developed within the new library building; and with our own portrait gallery and historical and ethnographical museum grown to far ampler proportions than now, it may safely be asserted that the combination will be worthy of the State, and of great practical value as a factor in popular education.

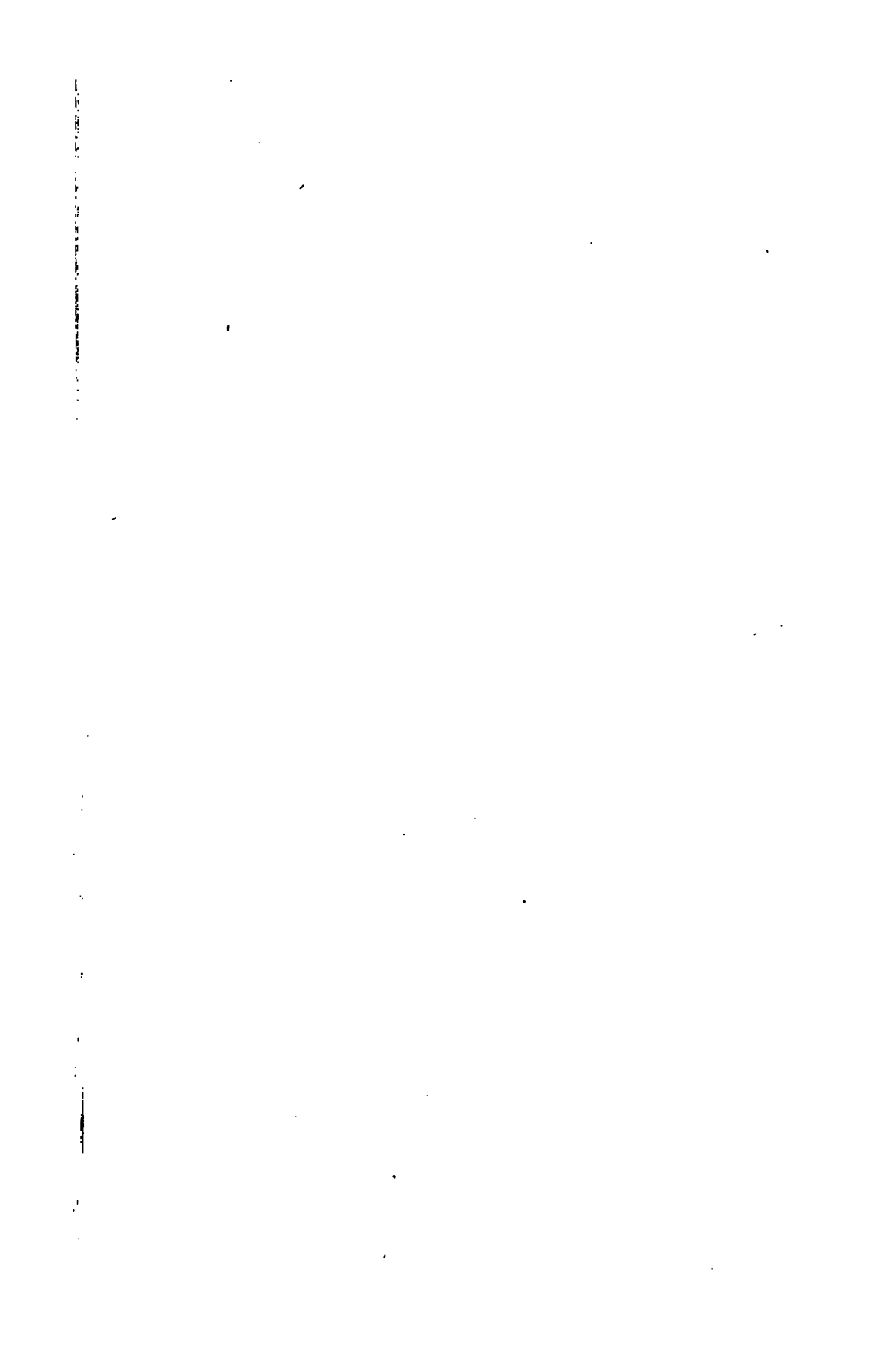
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From the Society

SPECIFICATIONS

FOR THE

COMPLETION OF THE

LIBRARY AND MUSEUM BUILDING

FOR THE

State Historical Society of Wisconsin

By FERRY & CLAS, ARCHITECTS

MADISON
DEMOCRAT PRINTING COMPANY
1897

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SPECIFICATIONS

FOR THE MATERIALS AND LABOR NECESSARY FOR THE
COMPLETION OF

The Library and Museum Building

TO BE ERECTED FOR THE STATE HISTORICAL SOCIETY
OF WISCONSIN, IN THE CITY OF MADISON, STATE
OF WISCONSIN, ACCORDING TO THE ACCOMPANYING
DRAWINGS, PREPARED BY
FERRY & CLAS, ARCHITECTS, OF MILWAUKEE, WISCONSIN.

GENERAL CONDITIONS.

DUTIES OF THE ARCHITECTS.

The Architects shall furnish such drawings and interpretations as may be necessary to illustrate the work hereinafter described. They shall superintend the work, and shall visit it at such times as may be necessary for the inspection of the materials and the construction, and provide such explanations of the drawings and specifications as may be necessary.

They shall condemn all such materials and work as are not of the quality, kind, or form required by these specifications and the accompanying drawings; and shall see to it that the intent and meaning of the plans, specifications, and contracts are carried out in good faith. They shall decide all questions respecting the true meaning of the drawings and specifications. They

shall issue certificates stating the amount of payments due the Contractors. In case any alterations in the drawings, or departures from the specifications, seem to them necessary, they shall refer the same to the Board of Commissioners or the Executive Committee thereof, and shall in no case order the same without authorization. They shall make a reasonable valuation on all work either added or omitted after the building is under contract, and shall keep a record of such changes, and certify them to the Board of Commissioners.

DUTIES OF THE CONTRACTORS.

The Contractors will be expected to give their personal supervision to the work, and either to be at the building at all working hours during its construction, or, in their absence, to be represented by reliable foremen, who shall be competent to understand the drawings and properly carry out that portion of the work undertaken by each. They shall be subject to the directions of the Architects and Superintendent, whom they shall provide with all necessary facilities for a thorough inspection of the materials and work.

The Contractors shall furnish all materials, labor, transportation, and utensils needful to the performance of the work in the different branches for which they have contracted, unless it is hereinafter distinctly mentioned that certain parts of the materials or work will be furnished by the Board of Commissioners, or by other parties.

Contractors will be required to execute factors in the work shown and not specified, or specified and not shown, on the drawings, where such factors are plainly implied.

All materials not specifically mentioned must be of excellent quality of their respective kinds; and all work must be executed in the best, most substantial and thoroughly workmanlike manner known to the craft, in accordance with the intent and meaning of the drawings and specifications, and subject to the approval of the Architects and Superintendent. Where a patented or special article is specified, others equally good may be used, if approved by the Board of Commissioners and the Architects,—such substitution to be made only on the written order of the Architects, countersigned by the authorized representative of the Board of Commissioners. The Contractors shall have their materials and labor in readiness at all times to take up their work without delay, and will be liable for all damages resulting from such delay of their own, or caused to other Contractors.

Should the Contractors introduce any material or work not of the kind or quality hereinafter specified, they shall, upon demand of the Architects or Superintendent, promptly remove the same, and replace it with material of a satisfactory nature; and they shall make good all damage done to the work of other Contractors by such transaction. If condemned material is not removed and replaced with satisfactory materials by Contractors, upon request or demand, the Architects will proceed to do so at Contractors' expense. The Contractors shall lay

out their work, and be responsible for its correctness. They must see to it that the work of other Contractors, coming in contact with their own, is correct; otherwise they will be liable for any changes in their own work made necessary by changes ordered in the work of others.

The Contractors shall obtain official permits for temporary obstruction of public highways caused by their work or materials, and pay all legal fees in connection therewith. They shall make all necessary enclosures and walks for the safety of the public during the progress of their work, and maintain lights at night, as required by law, or be responsible for all violations of the same.

It shall be incumbent upon each Contractor,—upon completing any portion of his contract and leaving the building, either temporarily or permanently, and at such times during the progress of the work as the Superintendent may direct,—to leave all his work, and all parts of the building in which he has been operating, in good order, free from rubbish or refuse material. Debris, or dirt of any kind, which shall be loosened by any Contractor in the performance of his contract, from completed parts of the work of another, shall be considered, under this clause, as belonging to the former, and shall be removed by him.

The Contractors shall protect their work against injury at all times during the construction of the building, and must repair all damage done thereto, leaving their work in perfect order at the completion of the building.

DRAWINGS.

The drawings and specifications are the property of the Architects. They will be furnished from time to time, as the progress of the work may require. They are to be used for this building only, shall not be copied for any other purpose, and are to be properly cared for and returned to the Architects, on completion of the building. The drawings with figures and lettering thereon are to be considered a part of, and as illustrating, these specifications. They shall be carefully followed according to the figured dimensions, where these are given; where no dimensions are given, the drawings shall be followed according to their scale.

The drawings are on a scale of one-eighth inch to one foot, three-eighths inch to one foot, three-fourths inch to one foot, or are full size. Numbers written on plans thus, (269), are intended to designate the spaces so marked as those referred to in the specifications by the corresponding numbers.

In case any of the drawings or these specifications are not sufficiently explicit or complete, or should an error appear in them, the Contractor shall notify the Architects of the fact, and in no case proceed in uncertainty. Should a mistake arise as a result of negligence of this kind, the Contractor liable therefor, will be required to correct the same at his own expense.

Whenever the words "as may be directed," or other expressions of similar meaning or intent are used, implying exercise of judgment or discretion, it is hereby

understood that the Architects and Board of Commissioners are referred to, or some person duly authorized to represent them.

The colors on the drawings are to be construed as follows: blue designates stone; red, brick; buff, terra cotta; yellow, wood; purple, galvanized iron; green, cast and wrought iron or steel; and neutral, old work.

CONDITION GOVERNING CHANGES AND SUBSTITUTIONS.

It shall be expressly understood, and is made a part of these specifications, that no substitution of others, for articles or materials specified, nor change of any other nature whatsoever, shall be made without the consent of the Architects and Board of Commissioners.

REFERRING TO THE PORTION OF THE BUILDING ALREADY BUILT.

All the structural iron and mason work below the second floor of the south half of the building, as far north as the temporary wall, is already in place. The balance of the building shall be included in the concurrent contracts. For position of temporary wall, see sheet No. 14.

COMPETENCY OF BIDDERS.

Proposals from parties who are not known to be regularly and practically engaged in the class of work

called for by the drawings and the specifications, or who do not possess ample facilities for doing the same, will not be considered.

BIDS.

Any bids which do not include all the requirements of these specifications and the accompanying drawings will not be considered.

The right is reserved to reject any or all bids, and to waive any defect or informality in any bid, should it be deemed for the interest of the State to do so.

ALTERNATIVE BIDS.

I.—Bidders on plastering and stucco must state in their proposals for how much less they will perform the plastering and stucco work, if the building be plastered with lime mortar, instead of adamant or its equal.

II.—Bidders on plastering and stucco must state in their proposals for how much less they will perform the plastering and stucco, if the stucco cornices and coves above them, together with the architraves around the ceiling windows in rooms Nos. 308, 310, 401, 405, 408, 410, 412, 413, 418, 419, 426, 430, 431, 432 and 433, are omitted.

III.—Bidders on plumbing must state in their proposals for how much less they will perform the plumbing, if the hot water system and everything connected therewith is omitted.

IV.—Bidders on carpenter work must state in their proposals for how much less they will perform the carpenter work, if the wainscoting in rooms Nos. 308, 310,

317, 410, 412, 413, 414, 415, 419, 425, 426, and 428 are omitted, and bases are put in their stead.

V.—Bidders on carpenter work must state in their proposals for how much they will perform the work of putting in wood baseboards and best hard, white maple floor in Nos. 135, 136, 212, 220, 221, 222, 223, 224, 225, 227, 235, 236, 237, and 238; this work must be in accordance with regular specifications.

VI.—Bidders on ornamental iron shall itemize their proposals so that the cost of staircases, passenger elevator grilles, freight elevator enclosures, passenger elevator cab, and freight elevator cabs each will show separately.

VII.—Bidders on electrical work must state in their proposals for how much less they will perform the electrical work if all the distributing wires in rooms Nos. 129, 139, 219, 239, 319 and 335 and the mezzanine stories in these rooms are omitted.

VIII.—Bidders on mason work and on cut stone must state in their proposals for how much less they will perform the mason work or furnish the cut stone if the following is omitted:

The balustrades on the walls around the terrace and on the retaining walls of the runways to basement; and the terrace wall above the street grades on the south, east, and north sides of the terrace. Note that the terrace steps and those parts of the terrace walls against which the steps finish must be built.

IX.—Bidders on painting work must state in their proposals for how much less they will perform the painting work if the wainscotings in rooms Nos. 308, 310, 317, 410, 412, 413, 414, 415, 419, 425, 426, and 428 are omitted and bases are put in their stead.

X.—Bidders on painting work must state in their proposals for how much they will perform the painting of wood baseboards and the oiling of maple floors in Nos. 135, 136, 212, 220, 221, 222, 223, 224, 225, 227, 235, 236, 237, and 238; this work must be in accordance with regular specifications.

XI.—Bidders on mosaic floors and marble work must state in their bid, what allowance they will make, if the marble wainscotings, except the bases, are left out in Nos. 6, 18, 142, 205, 217, 224, 233, 311, 312, 331, 332, 332 1-2, 414, 415, 425, and along the walls of the main stairs and their landings.

XII.—Bidders on mosaic floors and marble work must state in their bid, what allowance they will make, if the marble mosaic floors are changed to best quality vitrified white tiles, one inch tessera, except in the vestibules Nos. 107, 116, 123 and 132.

XIII.—Bidders on mosaic floors and marble work must state in their bid, what allowance they will make, if the tile floors and marble bases are left out in Nos. 135, 136, 212, 220, 221, 222, 223, 224, 225, 227, 235, 236, 237, and 238.

SPECIFICATIONS FOR MASON WORK.

EXCAVATIONS.

Remove all dirt, rock, rubbish, and manure from the basement of the building and from the old privy vault. Carry same from off the premises, or dispose as may be directed.

Make all necessary excavations for the footings of all walls, ducts for heating, steam pipes, etc., as indicated on drawings,—making excavations at least six inches larger in each direction than masonry.

After the walls and external cement coating of same are well set, refill in around them to get the grades shown and figured on drawings, and remove all surplus earth as above specified. The filling back of terrace wall, and behind the retaining walls at the runways to basement, for a distance of eighteen inches from the walls, shall be of coarse gravel from top to bottom. The grade on the east and south sides, outside the terrace walls must be finished as shown on sheet No. 15; on the north side, as shown on sheet No. 14. Outside of the east terrace wall, the grade must be raised to the level shown on sheet No. 14, and carried out at this height, a distance of at least twenty feet from wall. The relation of old and new grade is shown on sheet No. 14. This Contractor shall see to it that the plumber does not excavate for his work so as to endanger stability of walls or piers.

FOOTINGS.

All walls, columns, and piers are to have dimension stone footings of the sizes shown on sheet No.14, laid on their natural bed, in cement mortar, and firmly bedded in sand; the joints to be grouted flush and level, with Portland cement mortar.

These footings shall be of best quality of limestone, not less than eight inches thick; each stone to fill the course in width and height, and be not less than three feet six inches long under walls. The footing under terrace walls shall not project beyond the faces of same.

STONE-WORK.

Stone walls shall be random-coursed rubble masonry laid in cement mortar,—one part Portland cement to two parts clean, sharp sand. All weak angles in the stone must be knocked off, the stones roughly squared on beds and faces, and cleaned of dust and dirt: All stones shall be laid on their natural beds. The bed for stones shall be prepared with an ample quantity of mortar, in which the stone shall be firmly set; the use of spawls to fill out the bed will not be permitted. Vertical joints shall be carefully filled with mortar; the interstices shall be filled by thrusting chippings of stone into the mortar.

Binders shall be used in all courses, and the angles shall be constructed of cut or hammered stone. At least one-quarter of the stone in all faces shall

be binders. All stone terrace walls shall be built of best quality limestone from footing to top of wall.

BRICK-WORK.

All brick-work shall be of good, hard-burned, merchantable common brick, thoroughly wet, if laid in dry, warm weather, and to be kept dry, if laid in damp or freezing weather, and laid with full-flushed shoved joints, leaving no interstices or empty spaces in the work. All brick shall be laid in strong mortar, made of one part fresh lime, one part clean sharp sand, and one part Milwaukee cement.

The walls shall be of the thickness, form, and size shown on plans. All courses in brick walls shall be perfectly level and straight from one end to the other, so that the bearing-plates may be placed upon the walls without blocking up. Build and cut all necessary openings through the walls for drain-pipes, or for any other purpose required, and fill in around the pipes after they are in place; also build all channels for soil, ventilating, waste, water, and gas pipes, and for electric wires, and ventilating and heating flues. All necessary channels for conductors shall be cut into the walls in that portion of the building already constructed. Build brick discharging arches to take the weight of walls from off lintels over doors, windows, and other openings in the walls. Centers for same shall not extend upon jambs more than one inch. The arches shall be three rowlock courses high.

On the inside of all exterior walls there shall be a

thickness of hard-burned hollow brick, which shall be laid and tied into the walls with header courses of the same material. Fill up the openings at the ends of these headers with mortar.

The masonry core of the balustrade newels on top of the building, shall be of brick laid in cement mortar. All brick-work shall be bonded every sixth course with header courses laid in strong, regular bonds. Back up all stone facing with sound brick and mortar, immediately after it is set. Bed solidly all frames, and under-pin all sills with suitable mortar.

TERMINATION OF WALLS.

The walls of south half of building shall begin six inches below second floor level, and extend to roof. The inside walls of the loggias shall begin one foot lower than second-floor level. The walls of north half of building shall begin at footings, and extend to roof.

That portion of the retaining wall of the south runway still to be built, is that which rises above the finished surface of the incline. The walls of the south half of terrace, including stair walls of this portion, shall begin six inches below line of street grade.

Terminations of walls of the north half of terrace are shown on sheets Nos. 14 and 15.

AREAS.

Build the area walls of brick as shown on plans and sections. The facing shall be of select brick. The floor of the old and new window areas must be paved with select hard-burned brick laid in sand.

DAMP COURSE.

Lay a damp course in the terrace wall at the outside grade level, consisting of asphalt one-quarter-inch thick; cover the back of the wall from this damp course up to top with two coats of "Gilsonite" or "Antihydrine." Cover the back of the stone facing of the entire building with a good coat of "Antihydrine" or "Gilsonite."

Lay a damp course in the first joint above grade on the north half of the building, consisting of a one-quarter-inch layer of asphalt covering the entire wall. In the first joint above this, lay a one-eighth-inch thick sheet of asphalt paper. The outside of all basement and area walls, after they have set, shall be plastered with Portland cement one-half-inch thick, from footing to grade. This coating must be protected from the sun, and kept damp by sprinkling, until it is set and perfectly hard.

MASONRY OF HEATING SYSTEM.

All the masonry in connection with the heating system shall be built by this Contractor, and laid with Portland cement mortar, one part cement to three parts sand. The walls must not be built until the coils, blowers, and pipes are in position. The beds for blowers and engine shall be built as shown on sheet No. 14.

DRAIN TILES.

Put in three-inch drain tiles all along the inside of the outside walls of building, inside the terrace wall at the level of the grade outside, and back of the retaining wall of runways to basement entrances, parallel to the grade of same. The drain tiles back of terrace wall, shall empty through the wall to the outside, every fifty feet. Those back of retaining wall of runway, shall pass through the wall, and empty near the basement door.

CATCH-BASIN.

Build one catch-basin under basement floor of room No. 13 with eight-inch thick wall of sewer brick, laid up with Portland cement mortar; pave the bottom with brick, and plaster the inside with Portland cement mortar. It shall be thirty-inch diameter in clear, and be fitted at top with iron thimble and cover, set flush with basement floor.

DIMENSION STONES.

Build dimension stone piers, where indicated on the basement plan, from footing to second-story floor, of smoothly dressed limestones not less than ten inches thick.

BASEMENT FLOOR.

Basement floor is to be constructed as follows: first course to consist of six inches of broken stone well

rammed down; second course to consist of five inches of concrete, made of three parts No. 2 broken stone, two parts clean bank sand, and one part Milwaukee cement. Over this lay a finish coat one inch thick, composed of one part No. 4 crushed granite to one part of Alsen's Portland cement. This finish coat must have a smooth and even surface, sloping toward catch basins. In this manner cover the entire basement floor, excepting rooms No. 6 and 18, which, instead of the finish coat, shall have a mosaic floor laid on the concrete.

CONCRETE UNDER FLOORS.

All fire-proof arches of first, second, third and fourth story floors shall finish three inches below top of beams, and shall be covered with concrete six inches thick,—the concrete to be composed of four parts clean railroad-engine cinders, to one part of Milwaukee cement. Cinders and cement must be thoroughly mixed while dry, and then wet with enough water to bring the mass to a plastic condition. Where there are wood floors, concrete shall be laid on the floor arches, perfectly level, to a plane three-quarters of an inch above the top of the highest floor-beams. The second-story floor being one-and-one-half inch less in total thickness than other floors, the concrete shall be laid in this instance three-quarters of an inch below, instead of above, the top of the highest floor-beams, and the floor-strips notched out where they cross these beams. The floor-strips are then laid on the concrete,

and the space between strips filled in with concrete, level with the top of strips.

Where marble, tile, or mosaic floors occur, the concrete shall be filled in over floor arches, perfectly smooth and even, to a level one-and-one-half inches below the finished floor level. There will be marble, tile or mosaic floors in rooms Nos. 6, 18, 106, 107, 116, 117, 123, 124, 131, 132, 133, 134, 135, 136, 137, 138, 141, 142, 205, 206, 208, 215, 216, 217, 218, 220, 221, 222, 223, 224, 225, 226, 227, 230, 231, 233, 234, 235, 236, 237, 238, 242, 304, 305, 306, 311, 312, 313, 331, 332, 332 1-2, 333, 414, 415, 416, 417, 420, 421, 422, 425, 427, and 437. Floors in balance of rooms in first, second, third and fourth stories will be of wood.

TERRACE LANDINGS.

Turn four-inch brick arches between footing walls of landings to northeast and southeast terrace steps. Over these lay the landing floors in the same manner as described for basement floors.

LOGGIA FLOORS.

For that portion of loggia floors over ceilings of the vestibules below, the concrete bed must be prepared with lime mortar, so that the stone composing said ceilings shall not be liable to stain. Floors of loggias Nos. 206, 226 and 242 shall be laid with four inches of concrete over the tile arches, over which shall be laid a one-inch stratum of asphalt, turned up at the edges to the level of the finished floor;

and over this again a four-inch stratum of concrete to form a bed for the tiles. The concrete shall be the same as that for basement floors.

The floors of spaces marked Nos. 404, 409 and 432 over loggias shall be laid with concrete to a level four inches above the highest stone of the ceiling structure. This concrete shall be prepared with lime mortar.

ROOF COATING.

The fire-proof tiling of the entire roof must be plastered with a one-inch coat of Portland cement mortar, made of equal parts of Portland cement and clean sharp sand, worked to an even and true surface to prepare the roof-surface for the composition roofing. All saddles back of skylights and chimneys shall be made of concrete by this Contractor.

WALL FACING.

All exterior walls of the building shall be faced with cut stone, from a level six inches below grade to the height of the roof.

This facing shall be of buff Bedford limestone. The courses shall alternate six and ten inches in depth, and one-fourth of the stone shall extend at least eighteen inches into the walls. In connecting the new first story facing with the old, some of the old facing will have to be removed or recut, in order that the vertical joints may be arranged to work out properly at all points.

If any trimming is required on face stones, due to improper setting, it must be done at the expense of this Contractor.

The facing shall be laid in lime mortar.

POINTING.

After the walls are finished, all joints, including those in walls already built, shall be scratched out three-quarters-of-an-inch in depth, and pointed with Lafarge cement or Pozzuolana. All vertical joints shall be concave joints. The first-story horizontal joints shall be flush. The horizontal joints for balance of building shall be sharp cut bevel joints. All joints on top of cornices, and other surfaces which are nearly level, must be scraped out clean one inch deep, and filled with hot sulphur. This applies also to that part of the building already built.

CLEANING.

The face of all stone-work, including the part already built, must be thoroughly cleaned and washed off, after the completion of the building, with water and wire-brushes.

SETTING CUT STONE AND IRON.

All iron will be hoisted and set by the iron Contractor, with the exception of angles intended to hold the brick-work over window openings; these must be hoisted and set by this Contractor, who shall also fur-

nish mortar for the setting of all iron work. This Contractor must take charge of all cut stone as soon as the same is delivered on the premises. He shall also hoist and set the same. All stone too heavy for one man to handle must be set with the aid of a derrick. Stones hoisted by derricks must be secured to them by lewises, and not by tying ropes around them. Door-sills and granite steps must not be set until all masonry and plastering are completed.

PROTECTION.

The mason must protect against injury all stone sills, steps, and projecting work set by him, to the satisfaction of the Architects and Superintendent, by covering them with boards. He must protect all masonry against injury by frost, water, weather, or other cause, at all times during its construction; and will be held responsible for any damage thereto, until the completion and acceptance of the work.

SCAFFOLDING.

Furnish all the scaffolding necessary for the proper performance of the work coming under this contract, and grant the use of the same to other contractors for a reasonable length of time, removing it when their work is completed.

DRILLING.

Drill fourteen one-and-one-half-inch holes through walls, at entrances, for electric wiring, and five two-inch holes in basement walls for sprinklers; to be located as directed.

CUTTING AT ENTRANCES.

Cut recesses in the jambs of the three front entrance doors, and in the south-side entrance door-jambs, to receive stone lintels, which must be inserted in these openings by this Contractor. Also cut a four-by-four-inch recess around the jambs and heads of these door openings, as shown on plans, to accommodate the wood-work on the inside.

REMOVING TEMPORARY WALL.

The temporary wall on sheet No. 14 must be pulled down, and the brick and footing stones of same must be cleaned and re-used.

CHANGES IN EXISTING WORK.

Fill in the present opening for door in the first-story vault, and cut a new door-opening on opposite wall, where shown on plan. The bases under the second-story window balconies must be removed, and new stones must be set in their stead. The base of the corner pilaster at the extreme west end of the north facade of the west wing now built, also the corresponding pilaster base on the south wall of this wing, must be removed, and new bases be set in their stead. Some of the footings for the terrace stairways must be changed as indicated on sheet No. 2. The walls indicated by solid lines represent new work; those indicated by lines consisting of dashes represent old walls which must be removed. That portion of west

wall of the main building already built which lies north of the southwest wing (including the window-area walls entire), must be pulled down to the bottom of the basement window-sills, and be rebuilt with the same materials, moving all openings and the area walls eight inches southward in the wall,—the first-story window openings to be one stone-course higher than before. Any necessary cutting of stone facing, must be done by the cut-stone contractor.

The newels of the balustrade on the south terrace wall will be wider than the foundation walls for same already built, as shown and figured on the basement plan. Increase the foundation at these points, to the correct width, with concrete.

SPECIFICATIONS FOR CUT STONE.

GENERAL.

All stone must be of uniform color, free from defects that may impair its strength or appearance; all angles must be square, so that the joints will be of an even thickness at all points. All stone must be delivered at the building properly fitted; all fitting that may be necessary at the building must be done by this Contractor; cut the holes for all lewises into parts of the stone that will be covered up by other stones after they are set in place. If cut stone is shipped over 100 miles, it must be crated.

WALL FACING.

All exterior walls of the building on the south half, must be faced from second floor to top of building, and, on the north half, must be faced from six inches below grade to top of building with cut stone. The stone facing shall consist of Buff Bedford limestone from Dark Hollow (Ind.) quarry of the Consolidated Stone Co., Chicago. The stone must, in color, texture and quality, be identical with that used in the part of the building now erected, and with the sample on file in the office of the secretary of the Board of Commissioners, at Madison, Wisconsin.

A contract fixing cost of Bedford stone per cubic foot

for this building has been made with above company. Contractors can ascertain the cost of same from the Stone Company, or the Secretary of the Board of Commissioners. The cut stone includes all cornices, window-sills, area-copings, walls and ceilings in loggias, and ornaments on the face of these walls, the walls of runways to basement, the walls around terraces and their balustrades, and the ventilating chimneys on roof. The facing must be laid in courses alternating six and ten inches deep; about one-quarter of the stones in the ten-inch courses must be eighteen inches deep. The stones of pilasters and pedestals must extend as far into the walls as the corresponding courses of the stone wall facing. The angle-stones for main cornice must be large enough to keep the center of gravity inside the wall line. All stones constituting door-and-window-jambs and all external angles, must be rectangular solids—not cut away or clipped on the unseen angles.

JOINTS.

The joints must be distributed in conformity with the large scale elevations and sections on sheets Nos. 17, 18 & 19. The arrangement of joints there indicated shall govern the jointing of facing in general; no false joints will be allowed. There shall be no vertical joints in the jambs of openings.

FINISH.

All flat surfaces must be finished with a tooth-chisel by hand; the grooves shall be of the same num-

ber per inch as in the work already done; all mouldings must be finished smooth. The carving will be done by another contractor. Cut the profile for all carved mouldings, but for all other carving leave stone projection at least two inches larger in all directions than the size of finished ornaments. Cut throats to form drips, immediately under the front edge of all projecting flat surfaces. All column-fluting must be cut by this Contractor; it shall be roughed out to within one-eighth of an inch of finished surfaces before being brought to the building,—the balance shall be cut at the building. The balusters of loggias and window-balconies shall be square; those of terrace walls shall be round, with square ends.

LINTELS.

The lintels over all windows shall be one piece, the full depth of jamb. The three front-door openings and the south-side door-opening shall have stone lintels inserted, to form transoms.

PEDESTALS.

The body or die of column and pilaster pedestals shall be one piece of stone.

WINDOW SILLS.

All window-sills shall be dressed smooth on top and have a slope of one-and-one-half-inch per foot; but the beds must be horizontal.

The basement window-sills shall be no less than ten

by twenty-two inches; first-story window-sills no less than eighteen by twenty-two inches. The window-sills for stories above will vary in size, as shown on scale drawings.

DOOR SILLS.

There are no door-sills set in that part of the building already built, and all necessary sills for this part will come under this contract. All door-sills shall be of gray granite, dressed with a ten-cut patent hammer.

STEPS.

All entrance-platforms, steps, and terrace steps must be of gray granite, dressed with a six-cut patent hammer, and must lap at least two inches.

CHANGES.

The base courses of all the second-story window balustrades, of part already built, must be removed, and new ones be set in their places according to scale drawings; the old stone may be re-used in same course on new part of the building. The three window-openings in the west entrance wall will be raised one course; provide new lintels, and all stones that may be needed on jambs in consequence of this change. The old lintels may be re-used in new part of building where practicable. This entrance, and the three windows in this wall, also the basement windows under them, will be moved eight inches southward. This

will make it necessary to cut some of the stones at the south angle, before they are reset. The bases of pedestals, of the small pilasters on the extreme western end of each side of the southwest wing, two in number, and having a 4-inch projection, must be removed; and the opening thus left in the bases of the larger pilasters or piers must be filled by inserting a straight piece flush with what is left of the old base. The surface of the first-story cornice must be smoothed off where projecting bases have been removed.

SPECIFICATIONS FOR STONE CARVING.

All ornaments shown by the drawings on the outside of the building and in the entrance-lobbies, loggias over the side-entrances and the loggia in front of reading-room on east elevation, carved marble modillions in rooms No. 6, 18 and 116, and all carved marble mouldings in rooms Nos. 107, 116, 123 and 132, shall be carved by this Contractor. This includes part of building already built. All mouldings not of the ordinary kind, such as the faces of consoles, shall be carved by this Contractor. The Architects shall decide what constitutes carving, and what constitutes cut-stone work. All carving shall be done after the stone is set in place at the building.

For carved mouldings, the rough mouldings will be cut by the cut-stone contractor; but for other work he will leave large blocks, that shall be cut down by this Contractor. All carving shall be done by skilled craftsmen; and if any carvers are employed who have not the proper ability to produce the quality of work desired on this building, they shall be dismissed, upon demand of the Architects. All carvers submitting proposals for this carving, shall submit, with their proposal, half-size models of the Ionic capital as shewn on scale drawings, and photographs of work executed by them. In the award of this contract the artistic merits of executed work of the bidders, and their ability as modellers, will be considered.

All joints coming through carved mouldings and ornaments must be filled with a composition of stone-dust and shellac, before carving is commenced. All models for this carving must be done at Milwaukee by Frank Stevens of Milwaukee, Beil & Mauch of Chicago, or Schmidt & Staack of Chicago, and shall be paid for by this Contractor. He shall also pay shipping expenses on models. This Contractor must furnish the scaffolding required to do the work under his contract.

SPECIFICATIONS FOR STRUCTURAL STEEL AND IRON WORK.

GENERAL.

The Contractor for the structural steel and iron-work will furnish and erect in place, in the manner hereinafter specified, all the iron-work shown on the accompanying drawings or mentioned in the following specifications, to the satisfaction of the Architects and the Board of Commissioners.

This Contractor shall pay for all patent fees, or damages for infringements of patent rights, on any article or arrangements that may be used in any manner, in connection with the construction or erection of the work hereinafter specified.

Detail shop-drawings must be submitted for approval, before commencing work in the shop; and the Contractor shall make any alterations in the construction which the Architects and Board of Commissioners may require. This Contractor shall also furnish a complete set of detail working drawings, or blue-prints of the same, to the Architects.

MATERIAL.

All the wrought iron members entering into the construction of this building shall be "mild steel" of a uniform grade.

Test-pieces cut from the finished material, to sizes specified below, shall fill the following requirements, viz:—

The ultimate strength shall be 60,000 to 68,000 lbs. per square inch.

The elastic limit shall be one-half the ultimate strength.

The minimum elongation shall be 22 per cent. in eight inches.

The minimum reduction in area at fracture shall be 40 per cent.

The material shall bend cold 180 degrees to a diameter equal to the thickness of the piece tested, without crack or flaw on the outside of the bent portion.

A reamed hole for a three-quarters-of-an-inch rivet shall stand drifting to 50 per cent. larger diameter without cracking.

The finished material must be free from seams, flaws, or cracks, and have a smooth, first-class finish.

The tensile strength, ductility, and limit of elasticity shall be determined from standard test-pieces cut from the finished material, and planed or turned parallel—the pieces to have as nearly one-half square inch sectional area as possible; elongation shall be measured on original length of eight inches; two test-pieces shall be taken from each heat or blow of finished material—one for tension, and one for bending.

Every finished piece of steel shall be stamped on one side near the middle with the blow-number identifying the melt. Lacing-steel and small pieces may be

shipped in bundles securely wired together, with the melt-number on a metal tag attached.

No steel piece shall be heated in a forge or other fire after being rolled, but shall be worked cold, unless subsequently annealed.

All castings shall be of tough gray iron, free from injurious cold-shuts or blow-holes, true to pattern, and of a workmanlike finish; sample bars one inch square, cast from the same heat of metal in sand-mould, shall be capable of sustaining, on a clear span of four and one-half feet, a central load of 500 pounds when tested in the rough bar.

INSPECTION AND TESTS.

All material intended for use in this structure, and all work, will be subject to such inspections and tests at the mill or shop, and during erection, as the Architects and Board of Commissioners shall deem proper; and the Contractor shall at any time furnish samples of materials and other means for making the tests.

The mill and shop inspections are not to be considered final, but all material and work shall be subject to constant inspection until the final acceptance of the building.

Any unfaithful or improper work, that may be discovered before its final acceptance, shall be corrected immediately; and any unsatisfactory materials used in the work will be rejected and removed on the requirements of the Architects and the Board of Commissioners, notwithstanding that the same may have been overlooked by the inspector and estimated. The

inspection of any work shall not relieve the Contractor of his obligation to perform sound work, as herein specified; and all work which, during its progress and before its final acceptance, may become damaged from any cause, shall be removed and replaced by good and satisfactory work.

ERECTION.

This Contractor must provide all scaffolding and hoisting-apparatus necessary for the erection of the structural steel and iron herein specified, or shown on drawings; and will be held responsible for the safety of scaffolding, hoisting-apparatus, derricks, etc., used by him at the building.

BEAM CONNECTIONS.

Carnegie Standard Beam Connection Angles shall be used for all beam-framing, unless a special connection is required.

TIE-RODS.

All tie-rods between beams shall be three-quarters of an inch in diameter.

SEPARATORS.

Where two or more beams are shown to be set together, they must be provided with bolts and cast-iron separators spaced not more than five feet on centers. One separator shall be set at each bearing and

the others spaced at uniform centers as far as practicable. The separators shall be not less than three-quarters of an inch thick, and cast to fit exactly to the profiles of the beams.

Where distances, center to center, of beams and girders are not given, they must be placed at the minimum distance given in Carnegie's table of separators.

PUNCHING AND REAMING.

In all the work the diameter of the punch shall not exceed by more than one-sixteenth of an inch the diameter of the rivets to be used. Rivet-holes must be accurately spaced; the use of drift-pins will not be allowed, except for bringing together the several parts forming a member, and they must not be driven with such force as to disturb the metal about the holes. If the holes must be enlarged to admit the rivet, they must be reamed.

All field-connection holes must be reamed one-eighth-inch, and field-connections made with turned bolts one-thirty-second of an inch less in diameter than the reamed holes.

The rivet-holes for splice-plates of abutting members shall be so accurately spaced, that, when members are brought into position, the holes shall be truly opposite before rivets are driven.

RIVETING.

Rivets shall be of the best quality rivet-iron, and shall bend cold 180 degrees to a curve whose diameter

is equal to the thickness of the rod, without sign of fracture on convex side.

The pitch of rivets in all classes of work shall never exceed six inches, nor sixteen times the thinnest outside plate, nor be less than three diameters of the rivet. The rivets used shall generally be five-eighths, three-quarters, and seven-eighths of an inch in diameter. The distance between the edge of any piece and the center of a rivet-hole must never be less than one-and-one-quarter of an inch, excepting for bars less than two-and-one-half inches wide; when practicable, it shall be at least equal to two diameters of the rivet.

Rivets must completely fill the holes, have full heads concentric with the rivet, and be of a height not less than six-tenths the diameter of the rivet; and must be in full contact with the surface or be counter-sunk when so required, and machine-driven wherever practicable.

The strain allowed for bearing on rivets must not exceed 15,000 pounds per square inch, and for single shear the strain must not exceed 7,500 pounds per square inch.

ASSEMBLING.

All built parts must be completely assembled at the shop, and inspected by the Architects, the Board of Commissioners, or their representatives, before being shipped to the building.

The several parts composing built members shall be made perfectly straight and true before assembling.

Built members must, when finished, be true and free from twists, kinks, buckles, or open joints between the component pieces.

COLUMNS.

All the columns in this building shall be Z-bar columns built of steel, and must be proportioned according to sizes given on sheet 11.

All abutting faces of columns must be planed or turned off to an even bearing, square with the axis of the column, so that they will come in contact throughout.

The connections of girders and joists to columns must be of the proper proportions, and special pains must be taken to provide for eccentric loading in the proper manner. The columns on the south half of the building are built up to the second-floor level; they have cast-iron plates on them, with holes for connections to upper columns.

PLATE-GIRDERS.

All plate-girders must be built as marked on plans, and all stiffeners must have full bearings on both flanges of the plate-girders.

LINTELS.

All headers over openings carrying beams shall have at least an eight-inch bearing at each end. All fourth-story windows must have lintels of two four-by-four-inch angles bolted together.

FLOOR-BEAMS.

All floor-beams less than twelve inches high must have bottoms flush with the bottom of the twelve-inch beams. Beams twelve inches and over must have tops four-and-one-half inches below finished floor-level, excepting at second-story floor, where they must be three inches below floor-level.

All beams, supporting floor-arches, the lower flanges of which extend lower than those of the twelve-inch beams, must have two-and-one-half by two-and-one-half inch angles, 7.7 pounds, riveted to their webs at the level of lower flanges on twelve-inch beams, to support the arches. Exception shall be taken to the above order of framing of floor-beams over rooms Nos. 217, 224, 233, 311, 312, 317, 331, and 332, and all landings on main stairways, where the small beams shall be eight inches high; their tops must be flush with the tops of all larger beams. Angles on sides of large beams supporting arches, must be level with lower flanges of the eight inch beams.

ANCHORS AND BEARING-PLATES.

All beams and channels must have bearings on walls of not less than 8 inches; they shall be provided with pin-anchors, and steel bearing-plates. The bearing-plates for beams under nine inches high shall be three-quarters of an inch thick; those for ten-inch and twelve-inch beams shall be one inch thick; and those for larger beams shall be one-and-one-quarter inch thick.

CHANGES IN IRON ALREADY SET.

Where indicated on plans, some of the beams already set must be moved and reconnected, and some new beams added and connected to old work. Column No. 28 must be turned one-quarter round, including bottom-plate, and must be reconnected to beams in the best possible manner. Where new work connects with the old, do everything necessary to make proper connections.

STAIR-STRINGERS.

Put up the stringers for the main stairs, with all necessary angles to support treads, marble facing, and railing. They must be properly connected with girder of landing, and floor-girders, and be strong enough to support 120 pounds per square foot on the staircase.

SKYLIGHT CURBS.

Build a metal frame for the skylight curbs, as shown by the drawings on sheet No. 13.

AREA GRATING.

Basement window-areas, excepting those at the four windows either side of the west entrance, must have movable wrought-iron grates over them. The frames for these grates must be made of three-eighths by one-and-one-half inch iron; the bars must

be made of one-quarter by one-and-one-half inch iron, one-and-one-half inches on centers; run a three-quarters-of-an-inch round stiffener through the bars, with washers around it fitting closely between the bars. The other four areas must have a two-feet-and-six-inch-high wrought-iron fence around them. The frame for this fence must be made of two three-eighths by one-and-one-quarter inch bars placed horizontally; the vertical pieces must pass through the horizontal frame; they shall be round, one-half inch thick, and be set three-and-one-half inches on centers.

PAINTING.

All iron-work, before leaving the shop, shall be thoroughly cleaned from all loose scale and rust, and be given one good coating of pure boiled linseed-oil, well worked into all joints and open spaces.

After erection, the entire structure shall be thoroughly and evenly painted with two heavy coats of paint; the first coat shall consist of Harrison Bros. & Co.'s red lead, mixed with pure boiled linseed-oil; the second coat shall consist of Harrison Bros. & Co.'s Antioxide paint.

In riveted work, the surfaces coming in contact shall each be oiled and painted one coat, before being riveted together.

Pieces which are not accessible for painting after erection shall have two coats of paint before erection.

All screw-threads, reamed holes, or other finished or planed surfaces, shall be coated with white lead and tallow before being shipped from the shop, but no painting or oiling must be done until after inspection.

DISCREPANCIES AND OMISSIONS.

Any discrepancy in figures as given by the drawings, or omissions in definitely locating any piece or pieces in this structure, must be settled by the Architects before this Contractor proceeds with the work.

All necessary measurements for location of the structural material must be verified by this Contractor, and he will be held responsible for the same.

SPECIFICATIONS FOR ORNAMENTAL IRON WORK.

This Contractor shall furnish all material and work necessary to construct and fix in place the staircases and the three elevator-cabs and enclosures, hereinafter specified. All material shall be of the same quality as specified for structural steel and iron-work.

The workmanship in connection with this work must be of the very best kind; the castings must be sharp, true, and of the finest quality; the wrought iron must be of the best American make, having an ultimate tensile strength of at least 50,000 pounds per square inch. All cast iron must be of the finest quality and the surfaces of all castings must have the smoothest possible finish. The moulds must be lined with plumbago to secure the required finish.

STAIRCASES.

The staircase No. 103 shall be of cast iron, and shall be constructed as shown on sheet No. 24. It shall be built strong enough to support itself when loaded to 120 pounds per square foot.

The wall-stringers shall be secured to the columns which are nearest them. Provide the necessary framing back of plastering for the support of these stringers.

The exposed facia of the stringers of the stairs, including the facia of stair-well, must be of cast iron, paneled and moulded; they shall be three-eighths of an inch thick, generally, and must be secured in place with countersunk tap-bolts or screws. Provide all the necessary filling-pieces of shape, size, and profile required; the filling-pieces shall be secured in place with bolts and nuts, and spaced about two feet apart.

The treads and landings shall be of iron three-eighths of an inch thick, with diamond-shaped pattern on top.

The risers shall be of cast iron, with paneled fronts and backs, and of proper shapes to receive treads.

The staircase shall have cast-iron newels with paneled shaft, and moulded cap and cast-iron railing, secured to stringers, rail, and newels in the best possible manner.

The circular stairway in room No. 424 1-2 shall have a four-inch-diameter wrought-iron pipe standard, properly secured at the top and bottom to the floor-beams. It shall have cast-iron combination treads and risers, and a three-by-three-eighths-of-an-inch wrought-iron outside stringer securely bolted to treads and risers. This stair shall have a two-inch-diameter wrought-iron hand-rail, supported from stringer with wrought-iron standards. The rail shall be polished and electro-bronze-plated.

All the iron-work of these staircases must have one coat of pure boiled linseed-oil, well worked into all joints and open spaces.

EDGES OF FLOORS AT ELEVATOR SHAFTS.

The faces of floors where elevator shafts Nos. 130 and 140 are cut through shall be faced with cast iron in the same manner as stair-well facias.

PASSENGER-ELEVATOR GRILLES.

The grilles for elevator-shaft No. 104, in first, second, third, and fourth stories, shall be made of cast-iron, according to design shown on sheet No. 23; details to be furnished.

FREIGHT-ELEVATOR ENCLOSURE.

The grilles enclosing elevator-shafts No. 130 and 140 in basement, first, second, and third stories, and the intermediate stories, making 7 stories in all, shall be built as follows:

The angle-posts shall be of two-and-one-half-inch square wrought-iron pipes, with moulded caps and bases. Bases and center-and top-rails of grilles must be of cast iron, with carved ornaments on surface. The doors and entire frames of enclosures shall be filled out with screens made of three-thirty-seconds-by-three-sixteenths-of-an-inch wire, woven at right angles, one-inch mesh, every alternate wire to be doubled. These screens shall have frames made of three-quarters-by-three-eighths-of-an-inch iron channels. Provide the enclosures on each floor with furniture fronts, the door in which shall be hung with anti-friction hangers with steel tracks. The doors shall

have bronze elevator-door-locks, and grooved bronze thresholds. These enclosures shall be painted with one coat of pure boiled linseed-oil which must be worked into all joints.

PASSENGER-ELEVATOR CAB.

The cab for the passenger-elevator shall not cost less than \$500.00, and be of a design and finish similar to the enclosures. The design must be submitted to the Architects for approval.

FREIGHT-ELEVATOR CABS.

The cabs for the freight-elevators shall have a substantial frame of metal, and be enclosed three feet six inches high with quarter-sawed white oak. This wainscoting shall be paneled inside and outside, and have a moulded cap and base. The sides of cab above this, together with the cove and ceiling, shall be enclosed with wrought iron screens of two-inch mesh, made of three-eighths-by-three-thirty-seconds-of-an-inch metal, twisted and riveted where it crosses, and the ends of each piece of metal turned into a scroll. The floors of these cabs will be made by another Contractor.

SPECIFICATIONS FOR FIREPROOFING.

The Contractor for this work shall provide and fix in place floor-arches in the first, second, third, and fourth-story floors and stair-landings; also fix fire-protective coverings around the bottom flanges of all floor-beams and girders that may extend lower than the floor-arches.

This Contractor shall also furnish and set book tiles between the T-irons which form part of the roof construction, covering the entire roof, including spaces 409 and 434; he shall also build up the curb-wall of skylight twelve inches thick. All floor-arches, girder-covering, and book tiles must be of porous terra cotta. The floor-arches must be of end construction. All arches shall be ten inches high, excepting those over corridors Nos. 217, 233, 311, 312, 331 and 332, rooms Nos. 225 and 317, and all stair-landings, where eight-inch arches shall be used.

The floor-arches shall, after setting, be subjected to a test with a load of 800 pounds per square foot, and must stand the same to the satisfaction of the Architects and Board of Commissioners.

SPECIFICATIONS FOR COPPER AND TIN-WORK.

PRESERVATIVE.

All sheet-metal used, except copper, must receive two coats of mineral paint on the underside before being brought to the building. All copper must be tinned before soldering.

GUTTERS.

Line all the gutters with sixteen-ounce soft copper, of a brand approved by the Architects and the Board of Commissioners. Lap this copper over the outer face three-quarters of an inch only, and tack it closely; fasten the back edge in the same manner. Dress the copper well down to the form of gutters, and make the edges smooth and straight. All joints must be locked and soldered. See that the lining on which the copper is to be laid is securely fastened, and that the gutters have a proper pitch toward the outlets.

CONDUCTORS.

The conductors will be of wrought iron, set in place by the plumbing Contractor. Connect the iron conductors with gutters by heavy copper funnels which must be about two feet long, and twice the diameter at top that they are at bottom; fix a globe strainer over each conductor, made of No. 12 gauge copper wire.

FLASHING.

Do all flashing that may be necessary, and furnish the copper for same, which shall weigh 16 ounces per square foot. Turn the capping of roof-flashing into joints of masonry on chimneys. All flashing in mason-work must be bedded in mortar while this work is in progress; or, when this can not be done, scratch out the joint to a depth of one inch, insert the copper and fasten it in place with iron wedges placed eight inches on centers, pointing up the joints afterward with slater's cement. The edges of all composition roofs along chimneys and skylights shall be flashed.

FLAT SURFACES.

The outside surfaces of skylight curbs and of scuttle shall be covered with copper, ten by twelve inch sheets, with locked and soldered joints; each sheet must be perfectly square, and all to be of equal width. Every sheet must be cleated with a strip of copper soldered to sheet, and secured with extra long barbed wire-nails to the lining. On main cornice over all entrances, use sixteen-ounce copper, and turn up the front edge, as shown by diagonal lines on sheet No. 6, so that water collecting on cornice will not drip into the entrances.

CORNICES.

The cornice around the space No. 409 shall be made of sixteen-ounce soft copper, of a brand approved by the Architects.

SOLDER.

The solder used must be strictly half-and-half tin and lead, using at least 8 pounds thereof per square, run on with eight-pound soldering irons.

VENTILATOR CAPS.

All skylights shall have patent ventilator-caps 24 inches in diameter, made of galvanized iron, of the Star pattern, Watson's Pat., or other equally good. There will be seventeen of these required. They shall be, in all cases, equal in sectional area to the combined capacity of the pipes leading to them; and the openings to the outer air shall be twice the area of their respective sections. All, over 20 inches in diameter, must be of No. 20 iron—under this size, of No. 22 iron; stays supporting same shall be of one-quarter inch by one and one-half inch iron, set about one foot apart, but in no case to be less than four stays to each ventilator.

SKYLIGHTS.

Make the skylight frames of No. 24 galvanized iron, according to details. They must rest on a

wood plate, furnished by this Contractor and bolted to an iron frame beneath. Set one-half-inch tie-rods across skylight wells, from plate to plate, four feet on centers. These skylights shall have at least one-third pitch and shall be glazed with one-half inch thick rough plate-glass in single lights from eaves to ridge, of widths required by skylight plans shown on sheet No. 7. The glass of the main skylight must be in two lengths, brought together in an iron channel frame.

Ribs seven feet long, or over, must have iron cores 3 inches wide, and one-eighth of an inch thick. Ribs over ten feet long must have iron cores three and one-half inches wide, and three-sixteenths of an inch thick. All ribs must be made in the same manner as sample at Architects' office.

SPECIFICATIONS FOR ROOFING.

Cover the entire roof, including that over the loggia No. 226, with one heavy coat of best, distilled roofing-composition; on this lay four courses of No. 1 roofing-felt, well mopped between each layer to the full width of the lap; then cover the entire surface with one heavy coat of best, distilled roofing-composition, and in this lay a cap-sheet course of No. 1 roofing felt, with two-inch laps; then cover the entire roof with one heavy coat of best distilled roofing-composition, and a sufficient body of clean, dry, well-screened lake gravel.

If the roof is laid in cold weather, the gravel is to be applied hot. There shall be used for this roof, 160 pounds of roofing-composition per 100 square feet.

The roofs must be laid to the satisfaction of the Architects and Board of Commissioners, and the durability of the same shall be satisfactorily guaranteed for a term of ten years.

SPECIFICATIONS FOR CARPENTER-WORK.

GENERAL.

All the timber and lumber to be used in the construction of this building shall be well seasoned and of the best quality of the respective kinds, as below specified. All framing and joining must be made in a thorough, first-class manner, to the satisfaction of the Architects and Board of Commissioners, and in accordance with these specifications and the scale and detail drawings, many of which are already prepared and will indicate the nature of the entire work. This Contractor shall remove all board coverings to existing walls; also all dummy frames. This material shall become his property, and he shall make a proper allowance for same in his bid.

CENTERS.

Furnish and set all centers for all semi-circular, segment and jack (straight) arches, also for arches over tunnel. These centers and their supports must be strong enough to firmly hold the masonry that will be built over them. Centers must be left in place for at least twenty days, and then be removed by this Contractor. The centers under jack-arches must have a crowning of one-

fortieth the width of the opening. The centers under segment-arches must have a crowning of one-eighth the width of opening.

WOODEN ANCHORS.

Provide and set wooden anchors consisting of two-by-four-inch beveled edge stuff, bedded in the concrete of the floor, in gallery No. 317, to hold iron bolts for the stiffening of the gallery railing. These anchors must be set directly beneath and follow the curve of this railing.

GROUND.

All grounds shall be fixed in place perfectly plumb and true with the planes of the wall or partition in which they occur, and of the thickness directed by the contractor for plastering. All grounds for wood-finish on outside walls must be exactly one and one-quarter inches thick. All grounds for wood-finish of solid plaster partitions must project three-fourths of an inch over the iron studs on face side of partitions, and one-quarter of an inch over iron studs on back of partitions. These grounds shall be in one piece the thickness of the partition, and cut to fit around the iron studs. Provide grounds, of two-by-four inch wood frames, for all register-openings in metal-frame partitions. Grounds back of wainscoting, and back of planking in fourth-story rooms, must be four inches wide, fit closely between studs, and be fastened to expanded metal with long staples

which can be clinched; back of planking the grounds must be continuous in horizontal rows three feet apart. Set one-by-three-inch bevel edge grounds on roof, around all skylights and chimneys projecting above the roof, also around outer edge of roof at gutters, to which the flashing and roofing may be nailed.

FRAME FOR COPPER CORNICE.

Rough brackets or lookouts made of two-inch plank, shall be furnished and set by this Contractor, for the copper cornice over loggia No. 409, and he shall also line gutter of same with one-inch dressed boards, lining to reach as high as the edge of the roof and out to the edge of the crown-moulding of cornice.

FLOOR STRIPS.

There shall be two-by-three-inch floor-strips, sixteen inches on centers, under all wood floors. Fix similar two-by-four-inch strips under all plaster partitions. These strips shall be of pine, shall have one edge beveled, and be laid on top of the concrete; their top surfaces must finish to a perfectly level plane two and three-quarters inches above the tops of the highest floor-beams. The second-story floor will be one and one-half inches less in thickness; therefore the tops of floor-strips for this story will be but one and one-quarter inches above the tops of highest floor-beams.

The mason will fill in to the top of the floor-strips with concrete.

FLOORS.

Floors in the following rooms (by number), shall consist of two thicknesses over the floor strips; the first a lining of No. 1 matched fencing laid diagonally—the second or finished floor of kiln-dried, clear, selected, hard white-maple flooring, seven-eighths of an inch thick and two and one-half inches wide, blind-nailed to each floor-strip. The maple must be patent flooring, matched on butts.

There will be wood floors in rooms Nos. 101, 102, 105, 108, 109, 111, 112, 113, 114, 115, 118, 119, 120, 121, 122, 125, 126, 127, 129, 139, 143, 144, 201, 203, 207, 209, 210, 213, 214, 219, 228, 229, 232, 232 1-2, 239, 240, 241, 301, 302, 303, 307, 308, 309, 310, 314, 315, 316, 316 1-2, 317, 318, 318 1-2, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 334, 335, 401, 402, 403, 404, 405, 406, 408, 410, 411, 412, 413, 418, 419, 423, 424, 424 1-2, 426, 428, 429, 430, 431, 432, 433, and 434. In rooms Nos. 201, 207, 212, 213, 229, 240, 307, 310, 316, 317, 322, 323, 324, 328, 329, 401, 405, 408, 410, 412, 418, 419, 426, 428, 429, 430, 431, 432, and 433, lay borders along walls and around columns, ten floorings of wide, selected, white pieces, or alternating white and brown, as may be directed.

Smooth off the surface of the floors after they are laid, with planes and steel scrapers. Deliver same to painter in perfect condition for oiling. After the first coat of oil is applied, this Contractor must cover all the wood floors with building-paper weighing one pound per square yard.

WINDOW FRAMES.

All frames shall be made according to detail drawings. For sizes of material and construction of frames, see scale drawings and full-size details accompanying these specifications. The sashes for the windows in rooms Nos. 129, 139, 219, 239, 319, 335, and for windows of mezzanine stories in these rooms, and for windows in rooms Nos. 419, 415, 420, 422, 423, 424, 425, and 428, shall be one-light sashes, pivoted top and bottom; the oval sashes in rooms Nos. 310 and 329 shall be pivoted horizontally; the sashes for all other outside windows shall slide vertically and the frames for same must have boxes for weights. All sashes in partitions shall be stationary; all transom-sashes shall be hinged at bottom.

No frames shall be set until after the roof is on and floor-arches in place; leave off outside casings until the calking around the frames is done. This Contractor shall make dummy frames of two-by-six-inch stuff, and set them in place as the mason Contractor may need them for the purpose of laying his work properly, so that finish-frames, when set, will fit.

All window-frames shall be made of first clear pine. Put all weight-boxes together with tongued and grooved joints. Pulley-stiles and heads of box-frames must be of first clear Georgia pine, one and one-eighth inch thick. Opening in pulley-stiles, for inserting weights, shall be cut through back of the inner sash, and made with beveled end-

joints; the cover for these openings must be fastened with screws.

Furnish all box-frames of windows having plate-glass, in first, second and third stories, with No. 539 Norris' anti-friction pulleys with bronze faces, and three-inch bronze wheels for chain. Provide all other box frames with No. 747 anti-friction pulleys with bronze faces, and two-and-one-half-inch bronze wheels for chain. The frames for pivoted sashes shall be made of four-by-four-inch stuff. All inside stops shall be put on with round-headed screws and washers, placed not more than twelve inches apart; screws and washers to be of brass, and have a dull brass finish. Washers shall be set in flush with the surface of the wood.

Window-frames in plaster partitions must be made according to detail drawings. They shall have rough frames one and three-quarters of an inch by six inches, halved together at the angles, and held to the iron channels of the partition by heavy screws not more than twelve inches apart, driven in from behind the channels before the covering of the partition frames is put on. The segment-heads of third-story window frames must be shaped from glued sections. All window-openings must be measured before making the frames. All outside frames, both doors and windows, must be calked tight with oakum, after being set in place, around the entire frame. Put up frames for ceiling-sashes under skylights in fourth story, and in ceiling of room No. 225.

SASHES.

All sash must be made of first clear pine; those in rooms specified for hard-wood finish shall be veneered on the inside with the same wood as that used for balance of the inside finish.

All sliding sashes in first, second and third stories shall be hung with No. 1 Giant metal sash-chain and those in basement with No. 2 Giant metal sash-chain, provided with sash and weight attachment. The glass in all inside sashes shall be held in place with wooden stops, which shall be secured by round-headed brass screws. Sashes holding plate-glass shall be hung with compressed lead weights; other sashes shall be hung with iron weights.

Provide sash for ceiling-lights under all sky-lights three inches thick; and all transom and partition sash, where called for on plans, must be **made in the manner** indicated on scale drawings and shown on details. All transom-sashes over three feet wide shall be hinged with three butts; those less than three feet wide shall be hinged with two butts.

ORNAMENTAL TRANSOM-SASHES.

The ornamental filling in semi-circular transom sashes shall be of wood, carved as per detail drawings; the wood for this purpose shall be glued in three thicknesses.

DOOR-FRAMES.

All door-frames shall be made, according to detail drawings, of wood to correspond with the finish of the respective rooms to which they belong, and must be of the sizes required by their location, as per plans and scale drawings. Outside door-frames shall be of quarter-sawed white oak. Frames in solid plaster partitions shall have a rough frame back of the finished frame, one and three-quarters inch thick by six inches wide, halved together at the angles, and held to the channels of partitions with heavy screws not over twelve inches apart as previously described.

Frames must not be put in until the building is enclosed. In some cases expansion bolts will be necessary, but in ordinary cases use screws; fill the holes over the heads of bolts or screws with wooden plugs, the grain of which will run in the same direction as that of the frame.

This Contractor shall furnish all two-and-three-quarter-by-four-inch wood brick necessary to attach his work, and see that mason sets the same where needed.

Outside door-frames shall have rough frames behind them, which shall be secured to the stone jambs with expansion bolts, and to the sills with dowels; stops for these frames shall be screwed in place with round-headed screws and washers not more than twelve inches on centers. These shall be of brass and have a dull brass finish.

DOORS.

All doors are to be made of sizes and forms shown on plans and details. All wood for same must be thoroughly seasoned and kiln-dried. The wood for all doors not veneered, and the veneering of veneered doors, shall match in kind the wood finish of the various rooms in which they appear when closed; veneered doors must have staved cores of pine. All the doors in the first, second, third and fourth stories, including basement entrance doors, shall be veneered. All outside doors shall have cores one and three-eighths of an inch thick, of thoroughly-seasoned and kiln-dried pine, veneered on both sides; on the outside with quarter-sawed white oak seven-eighths of an inch thick, and on the inside with birch, one-quarter of an inch thick. The three center windows in loggia No. 226, and the center windows of loggias Nos. 206 and 242, will each have a sash-door under it, made in the same manner as the other outside doors. All water-closet doors shall be of birch seven-eighths of an inch thick and five feet six inches high, with four panels. Furnish and hang fifty-six small paneled doors to cut-out-cabinets, dust-chutes, water-pipes and electric-wire channels, placed where directed. The doors in the heating chambers (room No. 13) shall come under this contract.

INSIDE FINISH.

The inside finish must be executed in accordance with scale and detail drawings. All finish

must be securely fastened with finishing-nails of the proper size, the heads of which must be sunk beyond the surface of wood. All wood intended for natural finish must be blind-nailed in this manner. The wood for inside finish shall not be brought into the building until the plastering is perfectly dry. All wood for inside finish must be thoroughly seasoned and kiln-dried; and that for natural wood finish must be free from stains or blemishes of any kind. The surfaces of all finish shall be sand-papered smooth, before it is put in place. All curved finish must be worked out of solid pieces; no kerfing will be allowed. The back side of all inside finish must be painted by the painter.

KINDS OF WOOD FOR INSIDE FINISH.

The wood for all the finish in rooms Nos. 201, 203, 207, 209, 210, 212, 213, 214, 229, 230, 240, and 241, shall be first clear quarter-sawed white oak. The wood for all the other finish in the building, excepting basement, shall be second clear birch for paint finish. The wood for the finish in basement shall be second clear pine.

AMOUNT OF INSIDE WOOD FINISH.

That portion of the inside finish of the building which is to be executed in wood includes the following: all bases in rooms having wood floors, and top mouldings on bases in rooms having mosaic floors; wainscoting in rooms Nos. 225, 227,

305, 308, 310, 317, 410, 412, 413, 414, 415, 419, 425, 426, and 428; the casings and jambs of all doors and windows, and openings similar to doors, excepting the window-casings in room No. 225; the pedestals of columns and pilasters and the book-cases in room No. 225; the railing of gallery No. 317; all picture mouldings; the rail for stair No. 103 and for stair No. 424 1-2; partitions in rooms Nos. 12 and 20, and the partitions between rooms Nos. 8 and 15, and between rooms Nos. 15 and 16.

DOOR AND WINDOW FINISH.

Door-openings having semi-circular heads, shall be finished in wood below and including the transom; the finish above transom shall be of staff, excepting the frame and sash, which shall be of wood; see details. The return piece of the lower mitres of door and window casings shall be made of a solid piece. The ornamental work of door and window casings having square heads, shall be of wood, excepting the ornamented mouldings.

All carved mouldings or ornaments on casings, door-heads, or other wood finish shall be of papier-maché and composition, furnished by this Contractor, of a nature and appearance approved by the Architects, and of the kind indicated on the scale and full-size drawings. Relief ornaments on pedestals, and book-case caps in room No. 225, shall also be of papier-mache. Casings in the following rooms shall have carved mouldings: Nos. 142, 205, 217, 224, 225, 227, 311, 312, 317, 331, 332, 332 1-2, 414, 415, and 425. Put casings around all dwarf doors.

CASED OPENINGS.

All openings, with or without doors, shall have paneled jambs and casings of wood, the latter finished in the same manner as door openings, with the omission of stops.

BASES.

All base-boards must be one and one-eighth of an inch thick, with a grooved shoe at bottom and a moulded cap on top. The base shall not be less than ten inches high in any room, and shall be made according to details.

All bases in rooms having mosaic floors shall be of marble, fixed in place by the Contractor for the marble-work; but the moulding on top of same shall be of wood, and shall be set in place by this Contractor.

WAINSCOTING.

Wainscot the walls of rooms Nos. 225, 227, 305, 308, 310, 317, 410, 412, 413, 414, 415, 419, 425, 426, and 428, according to drawings. All lumber for wainscoting shall be thoroughly air-seasoned, and kiln-dried.

The paneled wainscoting shall be so framed that the panels may draw during shrinkage, without splitting. The stiles and rails shall be one and one-eighth of an inch thick. All wainscoting shall be secured in place with screws.

RAILINGS AND BALUSTERS.

The railing and balusters of gallery No. 317 shall be of white wood for painting, excepting the top member of the rail, which shall be of selected hard clear, white maple. The cap of pedestals mitreing with this rail, and the nosing of the floor projecting over the fascia of the gallery floor, shall also be clear, white maple. This baluster railing must be especially well fitted together and into the floor and be fastened with especial firmness. Provide six bolts, with washers to each section, running from wooden anchors embedded in the floor for that purpose, (see "Grounds" in this specification), up through balusters, and stopping below the maple top.

All balusters shall have a one-inch bored hole through them from top to bottom to prevent checking.

TOILET-ROOMS.

The fixtures in toilet-rooms will be open fixtures, and all finished wood-work belonging to same will be furnished and put up by the plumber. This Contractor however shall hang all doors to the water-closet stalls, setting them one foot above the floor, and attaching hinges and dial-locks.

HAND-RAILS.

Furnish and put up rails of selected white oak on stair No. 103 and on stair No. 424 1-2; for drawing of same see sheet No. 25.

PICTURE MOULDINGS.

Furnish and put up picture-moulding, as directed and as indicated on sections made according to detail drawings. The mouldings shall match the other finish, and be nailed to the wall every 16 inches in the following rooms: Nos. 101, 108, 112, 113, 115, 118, 119, 121, 125, 127, 201, 207, 212, 213, 227, 229, 240, 301, 302, 307, 310, 322, 323, 324, 328, and 329.

SHELVING AND HOOK CLEATS.

Provide each closet with two dressed shelves one and one-eighth inch thick. Fasten on walls entirely around each closet, and rooms Nos. 135 and 136, two strips for hooks, each one by six inches with moulded edges; one strip shall be five feet three inches above the floor; the other six feet six inches above floor.

CLOTHES RACKS.

In rooms Nos. 223 and 235 put up portable clothes-racks of quarter-sawed oak about eight feet long; they shall be made with four-by-four-inch standards on heavy foot-pieces; the top rail shall be two-by-ten-inches, with hooks each side, nine inches on centers; the bottom rail shall be two-by-six-inches; the entire frame to be mortised and tenoned. In the same rooms put twenty swinging brackets, each two feet six inches long,

of quarter-sawed white oak, hinged to cleats on walls; the hinges shall be of steel, three-by-three inches, and furnished by this Contractor. These brackets shall have three hooks on each side. Also put up in these rooms an extra cleat for hooks, set higher than the brackets as will be directed. All racks, brackets, and cleats shall be made according to details.

WOOD PARTITIONS.

The partition between room No. 8 and room No. 15, and between room No. 15 and room No. 16, shall be made of wood; two-by-four-inch studs and girts, lined with one-by-three-inch matched and bevel-edged boards on each side, put on vertically; six-inch-high base and a large moulding at ceiling. In rooms Nos. 12 and 20 the water-closet partitions shall be of wood; one-by-three-inch bevel-edged, matched boards, dressed on both sides and put on vertically; the posts, and top and bottom rails must be four-by-four-inch stuff, grooved for boards, and surfaced.

BOOK-CASES.

The book-cases in room No. 225 shall be made of birch for paint finish, as per scale drawings and details. The entire interior of book-cases shall be veneered with seven-eighths-inch-thick white oak. The shelves shall be of white oak, and shall be supported on movable cleats.

PLATFORMS.

The platforms in heating-chamber, on which heating coils will be placed, shall be furnished by this Contractor; they shall be of sufficient height to bring the coils to within twelve inches of the ceiling.

These platforms will be constructed of steel beams resting on brick piers; anchor two-by-six-inch pieces on beams, and cover these with one-and-three-fourths-by-six-inch matched and planed flooring, well nailed to the under pieces.

Platforms for tempering-coils are each to be provided with a large pivoted swinging damper, constructed of seven-eighths-inch matched and planed flooring. These are to be left unhung until directions are given by the Contractor for the Electric Service system.

Build a strong frame for platform in room No. 208, and lay a double floor on same, forming a gutter at the front for footlights according to details.

STEPS.

In rooms Nos. 309, 317, 405, 408, 432, and 433, put up steps as shown on plans; treads to be of maple, with rounded nosing and cove underneath; the curved risers must be steamed and bent to shape.

PLANKING OF FOURTH STORY WALLS.

Line all walls, not containing windows, in rooms Nos. 410, 412, 413, 419, 426, and 428, with

two-by-ten-inch pine plank from floor to ceiling. These shall be dressed on one side and on the edges and shall be grooved for receiving three-fourths-inch-by-one-and-three-eighths-inch maple splines. These planks must be put up vertically, well fastened at top and bottom, and to the grounds, which shall be set in horizontal rows three feet apart; grounds to be one-and-one-fourth-inch-by-four-inches, anchored to partitions. Cover the planking on these walls with best quality maroon-colored burlap, sewed together and tacked in place; cover the edges with narrow strips.

SCUTTLE.

Roof scuttle to be thirty by forty-eight inches in size; to be made of matched and planed fencing, on a good, strong frame of two-by-four-inch surfaced stuff. Construct a cover of wood for same and fasten to scuttle with wrought-iron hooks and staples.

THRESHOLDS.

All doors over mosaic or tile floors shall have thresholds made of No. 12 polished brass, fastened to a hard-wood base. All other doors shall have thresholds five-eighths of an inch thick, of birch.

DOOR-FENDERS.

Put up striking-knobs behind all doors. These will be furnished by the Contractor for hardware.

HARDWARE.

This Contractor shall furnish sash-weights, axle-pulleys, sash-ribbons and chains, screws and nails; balance of hardware will be furnished by hardware Contractor, and will be selected by the Architects and Board of Commissioners.

This Contractor shall fix in place all hardware, in a neat and workmanlike manner, to the satisfaction of the Architects. He will be responsible for all hardware after it is delivered at the building, and shall give receipts to hardware Contractor for same.

STRIPPING AND CUTTING.

The Carpenter shall furnish and put up all lumber necessary to carry out the plumbing work; all that shows shall be dressed and sand-papered smooth, and shall match the inside finish.

Do all cutting of wood for plumbing, steam-piping, and tubing for electric wires; and box in soil- and water-pipes as may be directed.

SCAFFOLDING.


This Contractor shall build all scaffolding necessary to the performance of all the work under his contract, and permit the use thereof to other Contractors for a reasonable length of time. Scaffolds shall be so constructed that they will be safe and convenient.

ENCLOSING.

This Contractor must close up all window- and door-openings temporarily with matched fencing; fix a sash with thirty square feet of glass in each opening; also fix temporary doors to all outside door-openings, and provide them with locks and keys. Remove the enclosure, when directed by Architects, for the purpose of drying the concrete of floors or plastering, and replace them again also when directed by the Architects.

OFFICE ON PREMISES.

Build an office twelve by sixteen feet in size, on premises where directed for the use of Architects, Superintendent and Contractors, constructed as follows: Six-by-six-inch sills, set on cedar posts; two-by-six-inch joists, two feet on centers; four-by-four-inch plates, nine feet above the floor; and two four-by-four-inch girts. Cover the outside of frame with No. 2 matched fencing, put on vertically. The roof shall be lined and shingled; the floor shall be of planed and matched fencing. Provide two windows with two twenty-eight-by-twenty-eight-inch sliding sash, and a one-and-three-eighths-inch-thick paneled door, hinged and trimmed complete. Put up a twelve-foot long table within, the top of which must be made of wide dressed boards.



PRIVY.

Build a privy where directed, five-by-ten feet in size, with the same quality and size of materials as those specified for the office on the premises. It shall have three seats, and a urinal trough at one end lined with galvanized iron. Dig a pit under privy five feet deep and line it with two-inch hemlock plank. The privy must be cared for by this Contractor, and cleaned by him when necessary. Remove the same, and all evidence thereof, when building is completed.

LOT ENCLOSURE.

There is a fence seven feet high at present, enclosing all of the lot, with the exception of ninety feet in width on the north end. This fence (on the north side) shall be moved north to the lot line, and the fences on the east and west sides must be extended to complete the enclosure of the entire lot. They shall be built on six-inch diameter cedar posts, with three strings of two-by-six-inch girts, and be covered with one-by-eight-inch common dressed boards nailed on from the street side. There shall be one large gate in the new section of the fence, having large strap-hinges, a bar for locking it when closed, and hooks to fasten it when open; and shall be placed where directed.

PROTECTION OF TREES.

All the trees inside the fence, and those trees on the outside of the fence not more than five feet away from the driveways, must be protected by putting boxes around them, eight feet high.

SPECIFICATIONS FOR HARDWARE.

GENERAL.

All numbers of articles of hardware, mentioned in this specification, unless otherwise stated, refer to Norwalk Lock Co.'s manufacture, and no deviation from these specifications will be allowed without the written consent of the Architects.

BUTTS.

All entrance-doors shall be hung with No. 3891 1-2 six-by-seven-inch self-lubricating butts, three to each leaf. All double-acting doors shall be hung with No. 4010 ten-inch flange, double-acting spring hinges. All other doors shall be hung with seven-by-six-inch ball-tipped extra heavy wrought-steel butts, with ball-bearing joints, three to each leaf. Water-closet-stall doors shall be hung with No. 404 nickel-plated spring hinges, constructed so that they can be clamped and bolted to marble slabs, two to each door. All transom-sashes which are not semi-circular shall be hung with four-by-five-inch hinges, two hinges for those not over three feet wide, and three for those over three feet wide. All dwarf doors shall be hung with No. 239 three-by-three-inch ball-tipped wrought-steel butts, two to each door. There are about fifty-six dwarf doors in all. Provide three butts for all doors over seven feet high.

TOP AND BOTTOM BOLTS.

All double, double-acting doors shall have the "stationary" leaves provided with No. 8601 1-2 top and bottom bolts of suitable lengths with rounded faces, and improved stops. All other double doors shall have their "stationary" leaves provided with No. 8598 top and bottom bolts of suitable lengths.

DOOR HOLDERS.

All outside doors and all double-acting doors shall be provided with No. 23 Beardsley door-holders, one to each leaf.

DOOR-CHECKS.

The swinging leaf of all entrance and vestibule doors shall have a Blount liquid door check and spring, size D.

KICK-PLATES.

All entrance-doors and all double-acting doors shall have kick-plates, two to each leaf.

FINGER-PLATES.

All double-acting doors shall have No. 8003 E, Helena finger-plates, two to each leaf.

LOCKS.

All locks shall have two cylinders and shall be master-key locks. All the entrance-doors shall have No. x8140 1-4 locks. The swinging leaf of double-acting double doors and all double-acting single doors shall have No. 8395 mortise dead-locks with rounded faces. All corridor doors, not included above, shall have No. x8417 mortise locks. All other doors, not included above, shall have No. x8628 1-2 mortise locks.

Dwarf doors, excepting doors to dust-chutes, shall have No. 0750 wardrobe locks; there are about forty-eight of these doors.

Striking-plates for all locks must be made with lips of proper length and form to protect wood-work.

INDICATING BOLTS.

All water-closet-stall doors shall have No. 8599 nickel-plated indicating bolts, with special strike-stop, which can be bolted to marble partitions. There are twenty-one of these doors.

LATCHES.

The eight dust-chute doors shall each have a mortise latch No. 897 x 8483.

LOCK TRIMMINGS.

All entrance-doors shall have a pair of handles and plates No. 8189 1-2. All single swinging

corridor-doors shall have one pair No. 8651, Helena knobs, and two No. 8490, Helena escutcheons. All other single swinging-doors shall have one pair of No. 8650, Helena knobs and two No. 8934, Helena escutcheons.

SASH-LOCKS.

All double sliding-sash shall each be provided with one No. 119 Champion meeting-rail sash-locks, two No. 8101 bar sash-lifts on bottom rails of lower sash, and one flush pull-plate on top rail of upper sash; also provide one pull-down hook and rod for each room. All single sliding-sash shall each be provided with one No. 119 Champion sash-lock with mortise strike, and two No. 8101 bar sash-lifts.

SASH-PIVOTS.

All the windows in rooms Nos. 129, 139, 219, 239, 319, and 335, and the windows of the mezzanine stories in these rooms, also the windows in rooms Nos. 415, 419, 420, 422, 423, 424, 425, and 428, shall be pivoted at top and bottom with Howarth's No. 62 reversible sash-centers. The oval windows in rooms Nos. 310 and 329 shall be pivoted horizontally with Howarth's No. 051 reversible sash-centers.

SASH-ADJUSTERS.

Every pivoted sash shall be provided with a Yale No. 1395 sash-adjuster.

TRANSOM-LIFTERS.

All transoms, excepting the semi-circular ones, shall be provided with Payson's Sure Grip transom-lifters.

COAT-HOOKS.

Provide six No. 8822 hat and coat hooks for each toilet-room, and one hook for every six inches of wall surface in closets Nos. 102, 105, 109, 111, 114, 120, 126, 135, 136, 137, 203, 209, 214, 221, 222, 228, 241, 303, 314, 315, 320, 321, 325, 327, 334, 402, 416, 437; for rooms Nos. 223 and 235, provide 600 hooks.

BASE-KNOBS.

Provide hardwood rubber-tipped base-knobs to protect the walls where necessary, as required.

ELECTRIC LIGHT SWITCH-PLATES.

All electric-light switches not located in cut-out cabinets shall have plates, provided by this Contractor, similar in finish to bell push-plates No. 8810 E, Helena. There will be about seventy switches requiring such plates.

ELECTRIC BELL PUSH-PLATES.

All electric bells for elevators and the call bell in room No. 213 shall have push-plates No. 8810, E, Helena. There will be twenty such push-plates.

SCREWS.

Furnish all screws necessary for fastening the above specified hardware in place.

UNSPECIFIED HARDWARE.

Any hardware required to complete the building, and not mentioned in these specifications, shall be furnished by this Contractor without extra charge, and it shall be in conformity with the design and finish of specified hardware for the same or corresponding parts of the building. In figuring this contract a careful examination of the plans and other drawings is urged, in order that omissions in the specifications, if any, may be detected before the proposal is made and allowance made therefor.

MATERIALS.

All hardware, herein specified, unless otherwise stated, shall be of extra heavy solid cast brass; the finish shall all be old or dull brass finish, excepting where it is specified to be nickel-plated.

SPECIAL DESIGN.

The Architects reserve the right to make drawings of special designs for all door-trimmings; and said special designs may be substituted for the designs herein specified, at the option of the Architects.

SPECIFICATIONS FOR PAINTING AND GLAZING.

GENERAL.

All painting must be done with strictly pure white lead and linseed-oil, of brands approved by the Architects and Board of Commissioners; any that does not stand to test, which shall be made prior to use, will be condemned. Add colors for shading only, and bring all painting and staining to the colors directed by the Architects and Board of Commissioners. All wood-work must be cleaned before priming; putty up all nail-holes, cracks, and defects, and smooth it off with sand-paper before painting the second coat. In puttying wood for natural finish, the putty must be colored to match the color of the wood. Contractors bidding on this work may ascertain the amount of wood-finish in the building, by looking over the paragraph on "Amount of Inside Wood Finish" in the specifications for carpenter-work.

All iron- and tin-work, unless otherwise specified, must be painted the same number of coats and same color as wood-work. The priming must consist of a good coat of red lead in oil.

EXTERIOR WORK.

Painting.

All exterior finished wood-work, not otherwise specified, shall be painted three coats of same color as the adjoining masonry. Sashes shall be painted black.

Natural Wood Finish.

All exterior wood-work intended for natural finish shall receive one coat of "Wheeler's" filler, rubbed down smooth; in case the wood is to be stained, add the stain to the filler. When dry, finish with two coats of best Pratt & Lambert Spar varnish, rubbed down with pumice-stone and oil; in this manner finish the outside of all outside doors.

INTERIOR WORK.

Natural Wood Finish.

All the inside wood-finish in rooms Nos. 201, 203, 207, 209, 210, 212, 213, 214, 229, 230, 240 and 241, clothes-racks in 223 and 235, hand-rail of stair No. 103, and No. 424 1-2, and cap of railing on gallery No. 317, shall have a natural-wood finish. It shall be primed with one coat of "Wheeler's" filler, rubbed down smooth. In case the Board of Commissioners desire to have the wood stained, it shall be done by adding the stain to the filler. Over this priming-coat apply three

coats of Pratt & Lambert's No. 38 Preservative varnish. Sand-paper the first two coats, and rub down the last coat with pumice-stone and oil.

Paint Finish.

All other wood finish in first, second, third and fourth stories, in rooms Nos. 1, 2, 3, 4, 5, 6, 7 and 18 of basement, on stairways Nos. 103 and 424 1-2, and the enclosures of elevator-shafts Nos. 130 and 140 and adjacent iron stairways, shall be painted three coats. The dissolvent for the first coat shall consist of pure linseed-oil; for the second coat, one-third oil and two-thirds turpentine; for the third coat, all turpentine. Over this apply two coats of "porcelite"—the first coat to be sand-papered, and the second coat to be rubbed down with pumice-stone and oil. The wood finish of basement, other than in the rooms above specified, shall have two coats of paint. Paint the back of all wainscoting, base-casings, jambs, and frames, one heavy coat of paint.

All papier-maché (such as door-heads and ornamented mouldings for casings), put on wood finish shall be painted one coat of water-proofing liquid, after which treat it the same as wood-work; where used in connection with hard-wood finish, stain it to match the color of the wood.

FLOORS.

The wood floors shall be finished with two coats of raw, hot linseed-oil, well rubbed down. There are to be wood floors in rooms Nos. 101, 102, 105,

108, 109, 111, 112, 113, 114, 115, 118, 119, 120, 121, 122, 125, 126, 127, 129, 139, 143, 144, 201, 203, 207, 208, 209, 210, 213, 214, 219, 228, 229, 232, 232 1-2, 239, 240, 241, 301, 302, 303, 307, 308, 309, 310, 314, 315, 316, 316 1-2, 317, 318, 318 1-2, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 334, 335, 401, 402, 403, 404, 405, 406, 408, 410, 411, 412, 413, 418, 419, 423, 424, 424 1-2, 426, 428, 429, 430, 431, 432, 433 and 434.

GLASS.

All glass shall be of the sizes figured on drawings. Select the best panes for the best apartments. They must all be properly bedded, tacked, and puttied, and be whole and clean at the completion of the building. Glaze all outside windows, inside windows, sash-doors, transoms and ceiling lights. All outside windows, excepting those of basement and fourth story, shall be glazed with plate-glass. The basement windows shall be glazed with A. A. double-thick American selected glass. The fourth story windows shall be glazed with A. A. double-thick American ground-glass. The doors between rooms Nos. 106 and 107, 107 and 142, 117 and 116, 116 and 142, 123 and 124, 123 and 142, 132 and 142, outside doors of 132, the doors between rooms Nos. 217 and 224, 217 and 225, 225 and 227, 224 and 233, and between 312 and 317, 317 and 332, shall be glazed with beveled-plate-glass. Windows between rooms Nos. 411 and 413, and the ceiling lights in fourth-story rooms, shall be glazed with double

thick American ground-glass. The transom sashes of semi-circular-head-doorways shall be glazed with plate-glass; the glass in these sashes must be in one piece.

The glass for all other sash-doors, transoms, sashes, and the interior windows, shall be double-chipped plate-glass. The glass for the ceiling-panels over rooms Nos. 225, 417, and 427 shall be worth \$4.00 per square foot.

The glass in ceiling-lights of fourth story under skylights shall be double-thick American ground-glass. This Contractor must reglaze all sash in which the glass may become cracked or broken, until the acceptance of his work.

SPECIFICATIONS FOR PLUMBING.

GENERAL.

This building will be on the north side of State street, and on the east side of Park street, and will stand back twenty feet from the street line.

This Contractor shall dig all trenches necessary for laying his pipes, and must refill them after the pipes are laid and tested. In filling trenches, the earth must be carefully hand-packed around the pipes and then rammed down to prevent after-settlement; all superfluous earth must then be removed from off the premises. The trenches for all pipes must be trimmed to a perfect grade, and have depressions for hubs of pipes, so that each length of pipe shall be evenly supported. All lead pipes must be secured in place on wood strips, in a position easy of access for examination. No pipes must be run in or near the outside walls; all pipes that are in danger of freezing must be encased in boxes, with mineral wool filled in around them.

All pipes must be free from defects, of uniform thickness, and of the weights hereinafter specified. All joints in cast-iron water-pipes must be calked with yarn and lead; all joints in iron drain, soil, waste, and vent pipes must be calked with oakum and lead. All cement and vitrified pipes must have the joints cemented. All connections

of lead with iron pipe shall be made with brass ferules of the same size as lead pipe, put into the hub of the iron pipe and calked with lead. Lead pipes must be attached to ferule with wiped joints or overcast bolted joint. All changes in the direction of iron, cement, and vitrified pipe must be made with curved pipe; connections between pipes must be made with Y-branches; no T-branches will be allowed.

WATER-SERVICE-PIPE.

All lead service-pipes shall be what is called extra strong pipe, and be of the following standard weights:

Lead pipes 1-2-inch bore, 2 1-2 lbs. per lineal foot,

Lead pipes 5-8-inch bore, 3 lbs. per lineal foot,

Lead pipes 3-4-inch bore, 3 1-2 lbs. per lineal foot,

Lead pipes 1-inch bore, 4 3-4 lbs. per lineal foot,

Lead pipes 1 1-4-inch bore, 6 lbs. per lineal foot,

Lead pipes 1 1-2-inch bore, 7 1-6 lbs. per lineal foot.

The service-pipes must not come nearer than eighteen inches to a sewer-trench. All service-pipes must be so arranged and laid that they will drain to bleed-pipes. They shall be secured to place in boxes set in the partitions in a position easy of access for examination; where this can not be done, they must be secured to boards on surface of plastering.

Connect the water-service-pipe, which shall be one and one-half inch in diameter. with the main street, and extend it from State street into the building to room No. 14. From room 14 extend a branch of one inch diameter to room No. 23. In each of these rooms connect the service-pipe with a 3-inch header of extra heavy galvanized iron pipe.

From the header in room No. 14 extend separate branches as follows:

One 1-2 inch branch to the sink in room No. 105.

One 1-2 inch branch to each drinking-fountain in corridor No. 142.

One 1-2 inch branch to the basin in room No. 223 and drinking fountain in corridor No. 217.

One 5-8 inch branch to the line of basins in rooms Nos. 139, 219, and 319.

One 5-8 inch branch to rooms Nos. 208 and 209 combined, and one to rooms Nos. 304 and 306 combined.

One 3-4 inch branch to the sink in room No. 316 1-2.

One 3-4 inch branch to rooms Nos. 214, 215 and 216 combined.

One 3-4 inch branch to each of the three lawn-sprinklers on south half of building.

One 3-4 inch branch to room No. 12.

One 3-4 inch branch to room No. 138.

One 3-4 inch branch to the hot-water boiler in room No. 11.

One 1 inch branch to the toilet-rooms Nos.

420 and 422 combined and to drinking fountain in corridor No. 414.

This makes a total of fifteen branches from this header.

From header in room No. 23 extend branches as follows:

One 1-2 inch branch to the basin in room No. 235 and drinking fountain in room No. 233.

One 5-8 inch branch to the line of basins in rooms Nos. 129, 239, and 335.

One 5-8 inch branch to rooms Nos. 230 and 231 combined.

One 3-4 inch branch to room No. 20.

One 3-4 inch branch to room No. 134.

One 3-4 inch branch to each of the two lawn-sprinklers on north half of building.

This makes a total of seven branches from this header.

The branches to toilet-rooms must run full size as far as the farthest fixture, with separate lateral branches to each fixture, excepting in rooms Nos. 420 and 422, where a one-inch branch supplies two toilet rooms. Here the main branch must have three-quarter-inch branches for each toilet room. The branches for fixtures shall be of the following sizes: Three-quarters of an inch for sinks, and one-half of an inch for basins, urinals, water-closets and drinking-fountains.

HOT-WATER SERVICE.

All hot-water service-pipes and fittings shall be Beyer's galvanized wrought-iron pipes. The main from boiler to header in room No. 14 shall

be one and one-half inch in diameter; to the header in room No. 23 it shall be one inch diameter. The headers shall be three inches in diameter, of extra heavy galvanized iron.

From the header in room No. 14 extend separate branches as follows:

One 1-2 inch branch to the basin in room No. 223.

One 5-8 inch branch to room No. 138.

One 5-8 inch branch to a line of basins in rooms Nos. 139, 219, and 319.

One 5-8 inch branch to rooms Nos. 208 and 209 combined and one to rooms Nos. 304 and 306 combined.

One 3-4 inch branch to the sink in room No. 316 1-2.

One 3-4 inch branch to the sink in room No. 12.

One 3-4 inch branch to rooms Nos. 214, 215, and 216.

One 3-4 inch branch to rooms Nos. 420 and 422 combined.

This makes a total of nine branches from this header.

From the header in room No. 23 extend separate branches as follows:

One 1-2 inch branch to the basin room No. 235.

One 5-8 inch branch to the line of basins in rooms Nos. 129, 239, and 335.

One 5-8 inch branch to the rooms Nos. 230 and 231 combined.

One 3-4 inch branch to the room No. 20.

One 3-4 inch branch to room No. 134.

This makes a total of five branches from this header.

The supply pipes to sinks must be three-quarters of an inch in diameter; to basins, one-half inch diameter. All these hot-water pipes must return full size to three-inch headers in the same rooms from which they originally ramify. Connect these return-headers to bottom of boiler by one and one-half inch pipes. These headers for returns must be made of Y's and forty-five degree L's.

DRAIN PIPES.

All drains must be of the sizes figured, and located where shown on drawings; the least inclination allowed for drains receiving waste from water-closets, sinks and other drains not over six inches in diameter and liable to receive solid substances, will be one-quarter of an inch to one foot; and for other drains to receive water, one-eighth of an inch to one foot.

The drains that connect with the street sewer must be trapped with running traps, located just inside the walls where drains leave the building; provide each trap with a hand-hole, furnished with a brass cap on the side of the trap, farthest from the wall, of the same size as the drain-pipe. All connections with the drain must be made back of this trap. There shall be a four-inch vent pipe connected with the drain, several feet back of this running trap, which must be extended into the open air at any convenient place, at least four

feet away from the nearest window. Put in eight clean-out tees, same size as drain, with bolted brass caps, where shown on basement plan. The inside of every drain must be perfectly clean and smooth. All drain-pipes under the building shall be extra strong case-iron pipe; the drain from building to sewer shall be vitrified clay pipe. The drains from conductors must empty into street gutters as shown on plan of basement.

SOIL-PIPES.

All vertical soil-pipes shall be of cast iron. They must extend 2 feet above the roof, in as direct a line as possible, must not diminish in size, and must not emerge near any window or ventilator. Flash around these pipes on the roof with twenty-ounce copper, calked into the first joint above the roof, and spread out over the roof ten inches wide. These pipes must have rests wherever possible. Soil-pipes having one or two closets connected to them shall not be less than 4 inches in diameter; those having six closets connected to them shall not be less than 5 inches in diameter; those having more than six closets shall be 6 inches in diameter.

WASTE PIPES.

Waste pipes shall be extra heavy cast-iron pipes. When lead pipe is used to connect fixtures with heavy vertical waste-pipes, or to connect traps with vertical vent-pipes, it must not be lighter than "D" pipe. All waste-pipes must ex-

tend through roof, be increased to four inches diameter before passing through roof, and be flashed same as soil-pipes. The waste-pipes from such fixtures as sinks and wash-basins must be one and one-half inch diameter; from boiler, one inch in diameter. The waste-pipes from drinking-fountains must empty into basement sink. The waste from boiler must empty into catch-basin.

VENT PIPES.

All traps must be protected against syphonage by ventilating the waste and soil-pipes at the head of the traps.

The ventilating pipes must be of cast or galvanized wrought iron, not less than two inches in diameter for water-closet traps, and one and one-half inches for other traps. Where they run up near the soil-pipe they may be connected with it two feet above the highest fixture; where they are too far from the soil-pipe, they must run up straight through the roof; increase them to four inches in diameter before passing through roof, and flash them same as soil-pipes.

CONDUCTORS.

The conductors will be inside of the building, and must be of Beyer's standard-weight wrought-iron pipe, coated with tar inside and out. For number and size of pipes, see sheet No. 2.

TESTS.

All plumbing pipes must be tested with peppermint or water test, by the plumber, in the presence of the Plumber Inspector and Superintendent; all defective joints or other openings must be remedied and made impermeable to gases; all defective pipe must be removed, and replaced by sound pipe.

CATCH-BASINS.

Build the catch-basins where shown on the basement plan, of vitrified pipe 24 inches in diameter, the finished bottom not less than two inches below the outlet pipe. The bottom must be grouted with two inches of concrete, and finished with one inch of Portland cement. The top must be level with basement floor and fitted with an iron rim and cover. Build such catch-basins to receive water from the drain-tiles around clean-outs; also to enclose the running traps in main drains. The catch-basins at traps of main drains shall be thirty inches in diameter. The steam catch-basin will be built of brick by the mason Contractor.

TRAPS.

Every fixture in the building must be separately and effectually trapped. The traps shall be placed as near the fixtures as practicable, and in no case shall they be more than two feet from any fixtures. They shall be of the same material

and same diameter as the pipe they are connected with. The drains receiving waste from the catch-basins must have their ends in the catch-basin, turned down six inches. Slop-sinks shall have three-inch-diameter cast-iron traps.

BLEED-PIPES.

All the cold-water service branches, and all the hot-water risers and return branches, the main service-pipe above the gate-valve in rooms Nos. 14 and 23, and the lowest point of return main to boiler, must have three-eighths-inch bleed-pipes connected to them at a point twelve inches above the headers; each of these six sets of bleed-pipes must be connected to a one and one-half-inch header.

These headers shall be connected with the nearest catch-basin by a one-inch wrought-iron pipe.

VALVES.

All valves must be of brass, same size as the pipes to which they are attached. All gate-valves shall be Chapman's gate valves. Attach a metal tag with supply directions to each valve.

There shall be two gate valves on the main service pipe, near the headers. All branches from cold and hot-water headers must have gate-valves located six inches above headers. All hot-water return-pipes must have gate-valves located twelve inches above the return header; these valves must be located between the

headers and bleed-pipes. Locate gate-valves in the hot-water-supply and return-pipes between the boiler and headers. Locate a wheel-handle globe valve in each bleed-pipe, as near the head of pipe as possible. Locate a globe valve on the supply pipe to each water-closet and urinal-tank.

SAFING.

All horizontal hot and cold-water pipes must be laid in lead-lined troughs; all vertical hot and cold-water pipes must run in lead-lined boxes. Three-pound sheet lead must be used for this purpose and the troughs and boxes must drain to the basement sink, through three-quarter inch light lead pipes. Hot-water pipes must be separated from cold-water pipes by a strip of wood.

LAWN SPRINKLERS.

There will be five lawn-sprinklers, where shown on sheet No. 2; not more than ten feet of galvanized iron pipe will be allowed on each, and each must have a lock-stop and hose-connection.

SURFACE DRAINERS,

Locate iron cesspools in front of the two basement entrance doors with strong iron grates over them. The waste-pipes from these must be four inches in diameter, taken out one inch above the bottom, and must connect with the nearest catch-basins.

WATER-CLOSETS.

All water-closets shall be Rundle & Spence Itaska plain vitreous china-ware closets; quarter-sawed white oak seats, with covers attached to bowls; nickel-plated brass chains, seat-trimmings, and bolts. In all rooms, excepting Nos. 208 and 215, the tanks, supply and flush pipes will be back of walls, in which case the flush and supply pipes shall be of lead, excepting that part which is visible back of closet. There shall be a flange on wall for these pipes to pass through. The chain shall run over two pulleys where it passes through the wall; the pulley on the closet side shall be of brass, nickel-plated, and the chain shall pass through a flange on the wall. These flanges shall be of brass, nickel-plated.

In rooms Nos. 208 and 215 the tanks will show in the rooms, and have nickel-plated brass flush-pipes, but the supply pipes will be back of walls. These tanks will be cased by Contractor for marble-work.

All tanks shall be copper-lined siphon tanks. The closets shall have brass floor-flanges and bolts, rubber gaskets, and lead soil-pipe outlets. In rooms Nos. 12 and 20, the tanks shall be cased with quarter-sawed white oak by this Contractor.

URINALS.

All urinals shall be large-size, flat-back, long-lip, Bedfordshire urinals. Provide nickel-plated brass inlet and outlet connections (Figures 208

and 209, Rundle & Spence Catalogue), and traps back of partitions. Provide each set of urinals with an automatic flushing cistern, set back of partition.

WASH-BASINS.

Provide conveyance for hot and cold water to all wash-basins. Wash-basins shall be 15x19 inch vitreous china ware, plain surface. Provide them with Rundle & Spence compression supply-fixture and "Model" waste combined (plate 204 A), elliptic trap (plate 129 A), and one-half inch supply-pipe with air-chamber (plate 115 A). In some rooms the supply and waste pipes must run to the floor, instead of through walls; in these cases they shall be as per plate 123 A. The supply pipes, cocks, wastes, and traps shall be nickel-plated brass. Slabs and legs will be furnished and set in place by the Contractor for marble work. In rooms 129, 139, 219, 239, 319, and 335 there will be mezzanine floors; thus in these rooms there will be two basins for every one shown on plans.

DRINKING FOUNTAINS.

There will be five drinking fountains, where shown on plans. Slabs will be put up by marble Contractor. Provide each with nickel-plated "Pierce" self-closing bibb cock, with flanges and wheel handle, nozzle reduced to one-fourth inch

diameter. Bibb must be attached to back, and nozzle must be six inches above slab. Put in a nickel-plated brass drinking-slab cup, with a nickel-plated brass bend underneath to carry the waste through the wall behind.

SINKS.

Provide conveyance for hot and cold water to all sinks, excepting that in room No. 105, which shall have cold water only. In rooms Nos. 137, 216, 316 1-2, and 422, set up Rundle & Spence Royal porcelain slop-sinks 24x20x12 inches, on painted cast iron trap-standard (Plate 276 A), omitting supply-fixture. Furnish same with three-quarters of an inch compression cocks; cocks, strainer, and visible pipes shall be nickel-plated brass. The sinks in rooms Nos. 12, 20 and 105 shall be 20x36 inch gray enameled-iron sinks, on galvanized iron brackets, provided with compression cocks; plug and chain for sink in room No. 105 only.

SPECIFICATIONS FOR ELEVATOR PLANTS.

GENERAL.

This Contractor shall submit, with his bid, for the approval of the Architects, a complete set of working drawings of the entire plant, showing location and arrangement of the elevator machines; motors, and their foundations; cars, and all devices and appurtenances thereto; guides and counter-balance sheaves, and their supports.

The drawings must be on a sufficiently large scale to properly illustrate all the important points of the elevator plants. Bids without detailed specifications and drawings will be rejected.

This Contractor shall take all measurements from the Architects' plans in preparing his specifications, drawings and estimates; but measurements taken at the building shall govern the actual construction.

All foundations for motors and gearings, and the pockets for elevators, shall be furnished and properly built by this Contractor, who shall carefully examine the structural-iron drawings and specifications where his work will come in contact therewith. All supports or constructions of any sort, which may be required in addition to those shown on these drawings, and which may be considered necessary for complete first-class

elevator plants, shall be furnished and set by this Contractor.

If any part or parts of the elevator plants, as proposed to be furnished by this Contractor, be covered by claims or patents of whatsoever nature, he shall settle the demand for royalties with all claimants and patentees, and shall liquidate any and all judgments obtained in the courts, by reason of infringements of patents. This Contractor and his bondsmen will be held strictly responsible for any delay or expense resulting from his failure to fully protect the owner against patent rights.

The Contractor must distinctly understand that, if his proposal is accepted, and he is required to execute a formal contract and bond for the faithful performance of his work, such contract and bond will also be a guarantee for keeping the elevator plant, and each and every part thereof, in perfect and satisfactory condition (usual wear and tear excepted), for a period of five years; and to remedy all defects (at his own expense), which may develop after the plants have been put in operation, by reason of the use of any inferior or defective materials or workmanship. All questions as to condition of the plants, what may be attributable to ordinary wear and tear, and as to what defects shall be remedied at Contractor's expense (as above), are to be determined by the Architects.

This Contractor will be held responsible for, and must make good at his own expense, any damage to the building and its contents done or caused by his workmen.

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All materials used must be of the best quality, and the entire work must be of the best character, executed by skilled mechanics in its different branches; and, when completed, must be in perfect running order, to the entire satisfaction of the Architects.

The elevator machines will be located in the basement.

The different parts of each elevator plant must be made as specified below.

TESTS.

The Contractor shall, at the completion of the work, test all the working parts of the elevator plant to their full capacity. He shall also test the plant by running the elevator continuously one hour under full load, two hours under half load, and four hours under ordinary service.

All tests shall be made in the presence of the Architects or their representatives.

CAPACITY AND SPEED.

There will be required in this building, three electric elevator plants.

The elevator in space marked 104 shall have a capacity of 3,800 pounds, at a speed of 150 feet per minute, and run from first floor to fourth floor.

The elevators in spaces marked 130 and 140 shall have a capacity of 1,800 pounds, at a speed of 100 feet per minute, and run from basement floor to fourth floor.

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The cars must attain full speed with full load in seven seconds after the closing of the starting-switches in the rheostats.

The metal elevator-cabs will be furnished by another contractor.

WIRING.

Service wires shall be carried by this Contractor, from a point in Park street (west side of building), where connection can be made with street railway, to the elevator machines in the basement of the building, and shall be provided by him with a set of fuse-blocks, just within the walls of the building. Furnish for each machine one set of fuse-blocks, one double-pole knife-switch, and one I-T-E circuit-breaker; all to be of a capacity proportioned to the amount of power required.

These safety-fuses and switches shall be placed conveniently near each motor.

This contractor shall also provide one lamp near each motor, taking out the wire for same at points back of the switches, so that the light will not be affected by the opening or closing of the switches.

The switches shall be mounted on slate bases.

The rules of the National Board of Fire Underwriters shall govern all wiring.

MACHINE.

The electric machine must be of the best material and workmanship throughout, and provided

Model

with all the necessary oiling devices. All parts of the machine must be mounted on, and securely fastened to, one complete cast-iron bed-plate of ample proportions, and made in one piece.

The motor and rheostat must be thoroughly insulated from all other parts of the machine.

MOTOR.

The motor, specially designed and built for this work, must be of the compound wound multipolar type, of moderate speed, and give not less than 90 per cent. efficiency.

The motor must run without sparking under all conditions of loading, within the rated capacity of the elevator.

The motor must have long self-oiling bronze bearings, and self-adjusting carbon brushes.

RHEOSTAT.

All contacts, switches, and all metal-work in the rheostat, through which the current passes, must be enclosed in an iron box, offering easy access to its contents and so arranged that the compounding in the motor is cut out automatically after full acceleration of the car is obtained.

The rheostat must be provided with a double-pole main switch, a double-pole reversing switch, and an automatic arrangement by which the resistance in the armature circuit is cut out gradually, and independently of the operator in the car. The resistance must be cut in before the contact is severed by the main switch.

The resistance in the rheostat must be so adjusted as not to take more than ten amperes on the first contact-point at a 220-volt circuit, to cut out five amperes at a time afterwards, and otherwise to comply with the rules and regulations of the Edison Company.

The main switch must be of the quick-make-and-break type, so constructed that it cannot be brought in slowly or held in any position which would cause the switch to arc and burn, and it must be of ample capacity to carry the necessary current.

WORM AND GEAR.

The worm must be accurately turned and cut from one solid steel forging.

The gear shall be of bronze, and accurately machine-cut so that worm and gear will operate noiselessly.

The worm and gear shall both be enclosed in an oil-tight housing and provided with bearings of large size lined with genuine babbitt-metal.

DRUM.

The drum shall be of large diameter, of the best quality of cast-iron, and must be accurately turned and grooved for the proper number of lifting and counterweight cables. It shall be bolted directly to the worm-gear in the proper manner.

AUTOMATIC TOP AND BOTTOM STOPS.

The machine must be provided with an automatic top and bottom stop, which shall stop the car at its terminal landings, independent of the operator.

SLACK CABLE-STOPS.

The machine must be provided with a slack cable-stop, which shall stop the machine in case the car or counterweights meet any obstruction in their downward course.

SHEAVES AND BOXES.

All sheave-wheels must be of as large diameter as possible, extra heavy, accurately bored and grooved; and those revolving loosely on their shafts must be provided with brass bushings and approved oil-cups.

The bearings must be of ample lengths and diameters.

The boxes must be of the ball-and-socket type, so constructed that any settling of the building will not throw the bearings out of line with each other.

The boxes must be provided with the necessary oil and grease-cups; and all necessary drip-pans must be provided, to catch any surplus oil or grease which may escape from the sheaves or bearings.

The sheaves must be so arranged that the pressure against the guides will be the same on both sides of the car and on both sides of the counterweights.

All beams supporting overhead work must be of the proper size to safely carry a full load in the elevator.

GUIDES.

The guides for the car must be of planed steel T's, of ample size and weight, and be firmly supported and fastened in the hatchway; the joints must be made perfect, so that the car will run smoothly and without noise.

The counterweight guides shall be of not less than 3 I-2 by 3-inch angle-iron, firmly fastened in the hatchway; and to these, hardwood strips shall be bolted, to make smooth and noiseless guides for the running of the counterweights.

The counterweight guides must be kept entirely separated from and independent of the guides for the car.

PLATFORM, CROSS-HEAD AND UPRIGHTS.

The frame of the platform shall be of well-seasoned hardwood, with a floor of quarter-sawed white oak. Crosshead shall be of steel, securely fastened to uprights made of not less than 6-inch channel bars. The uprights must be securely fastened to two channel-bars supporting bottom of platform. The corners of the platform must

be securely braced by connecting them with the uprights.

An approved safety-device, which grips the guides from the sides and brings the car to a gradual stop must be fastened to the channel-bars supporting the platform. This safety-device must be so constructed as to catch the guides in case the ropes should break, or the car obtain a dangerous speed. A governor must also be provided to operate the above safety device, in the manner described, without damage to the guides.

The platform must be provided with an approved lever-device for operating the car.

Elevators in spaces marked 130 and 140, must also be provided, on each of the eight stopping levels, with push buttons, electrically controlling the motors in such a manner as to start the car, wherever it may be, and bring it to the level where the button is being pushed.

The platform must be made as large as the hatchway will allow.

COUNTERBALANCES.

The car must be balanced as near as practicable by means of weights, hung from the head of the car by two wire cables. That part of the car not balanced, together with sufficient weight to properly overbalance the machine, must be suspended by two wire cables attached to that side of the drum opposite the lifting cables.

CABLES.

The cables must all be of wire, and have an ultimate capacity of 10,000 pounds. There must be four five-eighths-inch diameter lifting cables attached to the head of the car, and leading into the winding-drum. There must be two five-eighths-inch diameter cables attached to the head of the car and leading to the counter-weights. There must be two five-eighths-inch diameter, Leschen's patent, flat-strand, overbalance counterweight cables attached to the drum, and leading to the other set of counterweights.

There must be a three-eighths-inch diameter wire tiller rope to be used for the operating device.

INFORMATION TO BE FURNISHED.

The Contractor must state in his bid:

The speed and horse-power of the motors and the diameter of the drums.

The amount of current required to start the machines with full load, and the amount of current required to run the machines at full speed with full load.

The extent to which he proposes to overbalance the machines.

The weight of the machines set up on the foundations.

SPECIFICATIONS FOR VAULT DOORS.

The vaults Nos. 9, 110, and 211 shall be provided with iron vault-doors of the best material and workmanship, satisfactory to the Architects and Board of Commissioners.

The outside doors shall be made of one-fourth-inch boiler-iron, with inside panel-bars one-fourth of an inch thick by two inches wide on top, bottom and front, and three inches wide in rear, and with seven-eighths-by-two-inch bolt-frames. Each door shall have four cross-bolts, one up and one down bolt; all of one inch diameter. The bolts shall be operated by nickel-plated lever-handles, and be secured by four-tumbler combination-locks with nickel-plated knobs and dials. The hinges shall be fastened on the inside of doors and frames and have nickel-plated tips.

The inside or vestibule doors shall be made of one-eighth-inch iron, with panel-bars three-sixteenths of an inch thick and two inches wide, and lock-rails three-sixteenths of an inch by eight inches, to be provided with up and down and horizontal flat bolts, operated by nickel-plated T-handles, and secured by four-tumbler key-locks.

The vestibules shall be made of one-sixteenth-inch iron, the corners of which must be secured with one-and-one-half-by-one-and-one-half-by-one-fourth-inch angle-irons.

The vestibules shall be made with four-inch wide

flanges, so attached to angle-irons by screws, that, when removed, the fronts can be set after the walls are completed.

All the iron-work not otherwise finished shall be given four coats of paint and two of varnish, finish like safe-work, and ornamented as directed.

SPECIFICATIONS FOR MOSAIC FLOORS AND MARBLE WORK.

MOSAIC FLOORS.

The beds for all marble and tile mosaic floors shall be made of one part of Alsen's Portland cement, one part clean sharp sand, and three parts fine crushed stone. All mosaic floors, whether of tile or marble, must be rolled down firm and perfectly level; they must also be rubbed down smoothly, and given a high polish.

ORNAMENT ON FLOORS.

All marble and tile floors shall have borders not less than twelve inches wide; the field, unless otherwise specified, shall have small ornaments arranged in a diaper pattern about 2 feet apart; color of floors shall be as directed.

The floors in rooms Nos. 6, 18, 106, 107, 116, 117, 123, 124, 132, and 142 shall have rich ornamental patterns occupying about one-half of the area of the field within the border.

LOCATION OF THE DIFFERENT KINDS OF FLOORS.

In rooms Nos. 6, 18, 106, 107, 116, 117, 123, 124, 132, 142, 205, 217, 224, 233, 305, 311, 312, 331, 332.

332 1-2, 414, 415, and 425 there shall be marble mosaic floors, one-half-inch tessera.

In rooms Nos. 104, 133, 134, 135, 136, 137, 138, 208, 212, 215, 216, 220, 221, 222, 223, 225, 227, 230, 231, 235, 236, 237, 238, 304, 306, 416, 420, 421, 422, and 437 there shall be floors of best quality vitrified white tiles, one-inch tessera.

The floors of loggias 206, 226, and 242 shall be laid with four-inch square, drab-colored vitrified tiles, interspersed with small tiles of the same material but of another color, at each angle of the larger tiles.

MARBLE WORK.

This Contractor shall submit to the Architects, for approval, drawings showing the position of all joints and the sizes of marble pieces. All external angles must be mitred; and no patched or waxed materials will be accepted. All marble shall have concealed fastenings made of No. 8 copper wire, which must be securely fastened to the walls behind. All marble shall be of the best quality, well selected for color, and matched in figure before being set in place. If not otherwise specified, it shall not be less than one inch thick. Unless otherwise specified, all marble must be English pencil-veined white Italian marble. All mouldings shall be cut true to the details; and all visible surfaces, including carving, shall have the highest possible polish, excepting floors of stair-landings and tops of treads, which shall have a smooth finish, but no polish. The

treads and risers of stairs shall be bedded in mortar, and fastened to iron work in a substantial manner.

This Contractor shall do all necessary cutting and refitting of mosaic floors, marble partitions, wainscoting, and bases, that may be necessary for pipes or electric wires.

STAIR-LANDINGS AND STEPS.

The treads, risers, and landings of the main stairs from basement to fourth floor, and in vestibules 107, 116, 123, and 132, shall be of blue-veined Italian marble. The marble floor for each landing of main stairs shall be in three pieces one and one-fourth inches thick; the treads shall be one piece in length, one and one-half inches thick; and the risers shall be one piece in length and one inch thick.

BASES.

All walls, columns, pilasters, column and pilaster pedestals, and door-jambs in rooms having mosaic floors, shall have marble bases six inches high, of a color to harmonize with wood-work. In connection with white finish, English pencil-veined white Italian marble shall be used; and in connection with natural finish oak, purple-veined yellow Sienna marble shall be used. For the various kinds of wood used in the different rooms, see paragraph headed "Kinds of Wood for Inside Finish" in specifications for carpenter-work.

The base in room No. 225 must be ten inches high, and have openings cut into it for registers, of which there will be about twenty.

FACIAS OF FLOORS AT ELEVATOR SHAFT.

The facias of floors where elevator-shaft No. 104 is cut through shall be faced with marble. This facing shall return on floor and ceiling, eight inches wide by two inches thick,—finishing against the pilaster bases and capitals on floors and ceilings, and extending to the angles of the elevator-shaft on the facia.

STAIR-RAILS AND STRINGERS.

The rails and stringers of the main stairways from basement to fourth-story, including these members on mid-story landings and corridor landings, shall be of English pencil-veined white Italian marble; the panels on both sides of the railings shall be of Paonnazzo marble. The marble must be of thicknesses and moulded as shown on scale and full-size drawings.

WAINSCOTING.

The corridors Nos. 6, 18, 142, 205, 217, 233, 311, 312, 331, 332, 332 1-2, also room No. 224; the walls along main stairways, and their landings from basement to fourth floor; and the wall spaces between first-story landings of main stairways and first floor, shall be wainscoted

with English pencil-veined white Italian marble, to the height shown on drawings.

In room No. 142, the window-stool and jamb shall be of marble as high as the wainscoting. Slop-sink-closet No. 216 shall be wainscoted 5 feet high, with plain cap and base. Put up a marble slab-back for the slop-sink in room No. 137, three feet wide by five feet high by one inch thick. Put up slabs of this size on each side and back of slop-sink in room No. 316 1-2.

VESTIBULES.

The four vestibules Nos. 107, 116, 123, and 132, shall be finished entirely in marble, as per scale and full-size drawings.

CARVING.

The carving of mouldings and modillions in the vestibules, and the carving of modillions in rooms Nos. 6 and 18 shall be executed by the Contractor for the carving; but this Contractor shall cut the marble in the rough, as near as possible to the finished bulk of the carving. The marble for all carving shall be white Italian marble.

TOILET-ROOMS.

Wainscoting.

Rooms Nos. 134, 138, 208, 215, 230, 231, 304, 306, 420, and 422 are toilet-rooms, and shall be wainscoted six feet six inches high. This wainscoting

shall be one piece in height, one inch thick, and have a moulded cap and plain base.

Water-Closet Partition.

Where there are two or more water-closets in a row, the stalls shall be built as follows: partition shall be one-and-one-fourth-inch thick, five feet six inches high, set twelve inches above floor. They shall be securely clamped to front piece and to the wainscoting at the back. The end partitions, and partitions enclosing single water-closets, shall be six feet six inches high, one-and-one-fourth inches thick, and reach to the floor, and shall also be securely clamped to front and back. Front pieces shall be one-and-one-fourth inches thick, six inches wide, and six feet six inches high, set on the floor in brass shoes. Secure a brass standard to the top of each, and connect these by a two-inch-diameter brass rod. This Contractor shall attach the door-hinges and striking-plates to front pieces of stalls.

Urinal Stalls.

The urinal stalls shall be built as follows: the floor-slabs shall be two inches thick, two feet four inches wide, and two feet four inches long—or if there are several stalls side by side, there shall be one floor-slab extending their entire combined width; countersink floor-slabs as directed, and provide them with a two-inch gutter at the back. The partitions shall be one-and-one-fourth inches thick, six feet six inches high and two feet four inches wide. The partition-slabs between urinals

shall have the bottom ends cut out, so that only six inches at front edge rests on floor-slab. End partitions, however, must finish solid to the floor. The backs shall be seven feet high, one-and-one-fourth inches thick, and shall be properly clamped to partitions and to floor-slabs. Set up a slab six feet six inches high, two feet wide, and one-and-one-fourth inches thick, between sink and wash-basins in room No. 422.

Basin-Slabs.

Slabs for wash-basins having more than one opening for basins shall be two inches thick; those having but one opening shall be one-and-one-fourth inches thick. They shall all be countersunk three-sixteenths of an inch, have moulded edges, and be provided with five-by-seven-eighths-inch aprons.

Basins in rooms not wainscoted with marble shall have marble backs and sides sixteen inches high. Sinks in rooms which are not wainscoted shall have marble tops one-and-one-half inches thick, marble backs twenty-four inches high, and marble aprons five inches wide. All angles of basin-slabs standing free, shall rest upon metal legs fashioned with a curve, so that the foot shall stand back from the front edge of slab. All slabs over five feet long shall have metal legs about two feet six inches on centers. Rooms Nos. 129, 139, 219, 239, 319 and 335 will have mezzanine floors. There will therefore be two basins for every one shown on plans for these rooms; each of these basins must be provided with two legs. All work

in toilet-rooms shall be done according to details, and as directed. All marble in toilet rooms must be of the same tint of English pencil-veined white Italian marble that is used for wainscoting.

Tank-Casing.

In room No. 208 the closet-tank shall be cased with marble one inch thick, bolted to wainscoting with nickel-plated brass brackets. In room No. 215 the wainscoting will be kept clear of the wall by about ten inches and must have a cap reaching across this interval, which shall project six inches beyond the face of the wainscoting, and on which the water-closet tanks will be placed. A vertical piece of marble fourteen inches high shall be set on the front edge of the shelf to hide the tanks.

Trimmings.

The metal trimmings necessary for the marble in the toilet-rooms shall be of polished brass nickel-plated, and furnished and fixed in place by this Contractor.

DRINKING FOUNTAINS.

For each drinking-fountain, fix in place a marble wall-slab twelve by thirty inches, and one-and-one-fourth inches thick, with curved ends and moulded edges. To this fasten, with two brass brackets, twelve inches from the bottom edge, a countersunk marble slab one-and-one-half inches thick, with a hole in center for the drip-cup. There will be five drinking-fountains, located where shown on plans.

DRILLING.

This Contractor shall drill all the holes necessary in his work for all plumbing and steam-pipes, and for anything else that may pass through floors or marble-work, such as floor-plates for door-bolts, and stops.

SAMPLES.

Each bidder shall submit, with his bid, samples of mosaic floor, and of the various kinds of marble herein specified for his work. The mosaic-floor sample shall be three feet square, and the marble samples shall be two feet square.

DRAWINGS.

The bidder's attention is called to sheets Nos. 23, 24, 25, 26, and 27, which show the marble-work in elevation; and to sheet No. 23, which shows the construction of stair-stringer and railing.

SATISFACTION AS TO RELIABILITY OF BIDDERS.

Bidders on this work must demonstrate, to the satisfaction of the Board of Commissioners and the Architects, their ability to furnish the quality of materials and to do the character of work herein specified.

SPECIFICATIONS FOR PLASTERING, STUCCO AND STAFF WORK.

PLASTERING.

General.

This Contractor is not required to heat the building during the execution of his work. Every interior wall, partition and ceiling in the building, shall be plastered. This Contractor is required to do all furring necessary for the proper execution of the work under the above principal head.

Furring.

The inside of all outside walls and division walls, from basement floor to roof, including walls back of heating and ventilation pipes, and the inside of skylight-curbs, shall be furred by this Contractor with three-fourths-by-three-eighths-inch channel irons, their three-eighths-inch surfaces against the wall. They shall be put on vertically sixteen inches on centers, and secured with heavy staples. Furr also and in like manner, for plastering, the frame for the railings of the main stairways. (See "Lining for Stair-rail" in this specification.)

Partitions.

All partitions in the building shall have metal frames made of three-fourths-by-three-eighths-inch channels, set twelve inches on centers. The

studs around room No. 225 shall consist of one-by-one-half-inch channels, 0.83 pounds per foot, twelve inches on centers. These studs must be set true and plumb, and be securely fastened at top and bottom. In the case of tile ceilings, they must extend into the tiles; in the case of suspended ceilings, they must be secured to ceiling-channels with metal clips; at the bottom, in all cases, they must be fastened to a wood ground, with double angles made of heavy hoop-iron, riveted to the studs and nailed to the grounds.

All partitions around corridors, stairways, room No. 225, and wherever they are shown more than two inches thick on the plans, shall be double, and have separate studs for each side. The studs for these partitions shall be one-by-one-half-inch channels, twelve inches on centers. Fasten bracing from back to back of double partitions, as will be directed. All bays between pilasters in all corridors are to be paneled one inch deep. All wall-spaces around main stairways are to be paneled 3 inches deep. Frame in headers at top and bottom of these panels; recess the studs back of the panels to the proper depth; and fasten them to headers with metal clips or brackets riveted to each, as per details. Set headers and trimmers around openings for registers and dwarf doors.

All partitions must be braced in the most thorough manner until the plastering has set. All headers and trimmers around openings shall have holes 12 inches on centers, so that wood-work can be screwed to them.

Suspended Ceilings.

All ceilings immediately under the roof shall be made by suspending an iron frame from the roof-beams, consisting of two-by-two-inch steel channels placed six feet apart. Under the main channels, and at right angles to them, fasten three-quarter by three-eighths inch channels, 16 inches on centers, with wrought-iron clips. The hangers shall consist of wrought-iron rods, of sizes proportioned to the weight to be carried, and fastened to the beams and channels with iron clips.

There shall be a suspended frame for ceilings in rooms Nos. 113, 119, 134, 135, 136, 138, 205, 214, 215, 216, 230, 309, 415, 420, 422 and 425; also under loggias in room 101, 108, 115, 118, 122 and 125. Frame out where directed for scuttle, ceiling-lights and vent-pipes.

Fire Proofing of Columns.

All structural columns in the building shall have a fire-proof covering; also all structural beams at the facias of openings through floors. Prepare the columns, beams, and girders by framing vertically around them with three-fourths-by-three-eighths-inch iron channels, and cover them with expanded metal. After the plastering is finished on the above lathing, the columns shall have a second furring and lathing, over which the finished plastering shall be done. For position and number of structural columns, see sheets Nos. 9, 10, 11 and 12.

Lining for Stair Rail.


The iron frame for the railing of the main stairways shall have a lining of plaster on each side, to which the marble will be cemented.

Lathing.

After grounds for casings, bases, wainscoting and picture-mouldings are on, cover all walls and partitions with 24-gauge steel, one and one-fourth inch mesh, expanded metal lath, and lace it to studs with No. 20 lacing-wire. Cover suspended ceilings and columns with 27-gauge, one and one-fourth inch mesh, expanded metal lath, fastened in place with No. 20 lacing-wire. No ceilings formed by the bottom of floor-arches need be lathed; the plastering shall be done directly on the bottom of the arches themselves. Plaster the ceilings of basement, first, second and third stories, directly on floor-arches.

Plastering.

The surface of all plastering must be perfectly true; the ceilings must be perfectly level and the walls must be perfectly plumb and even with the grounds. All angles must be sharp and true. Run screeds at proper intervals, on both walls and ceilings, to secure true surfaces. The material must be kept perfectly dry until it is tempered; any material which has been exposed to dampness will be rejected. The mixing-boxes must be thoroughly cleaned before each tempering; no retempering will be permitted



The plastering shall consist of three coats. The first shall be a heavy coat, well worked, to give perfect clinches; its surface must be well scratched, and allowed to become perfectly dry before the second coat is applied. On this first coat make the screeds, and then apply the second coat between the screeds, and rod it to a true and even surface. Allow it to become perfectly dry before the third or finishing coat is applied. The third coat must be worked to a smooth surface with felt-covered floats. It shall not be applied until the cornices are run, and the staff work is in place.

All plastering shall consist of adamant or other materials equally good, subject to the approval of the Architect and Board of Commissioners. If adamant is used in plastering, it shall be as follows:

The first coat: On brick or fire-proof tile No. 2 B; on solid partitions, No. 3; on expanded metal lath, No. 2 W.

The second coat: On brick or fire-proof tile, No. 2 B; on solid partitions and on all expanded metal lath, No. 2 B. W.

The third coat: In all cases No. 1 X.

As above specified, plaster the entire first, second, third and fourth stories, including room No. 411 and rooms Nos. 1, 2, 3, 4, 5, 6, and 18 of the basement, also all solid plaster partitions in balance of basement, the lining of stair railings and the fire-proofing of all columns. The outside walls and ceilings in balance of basement must have one heavy coat, floated off smooth. The inside

of skylight-curbs, and walls back of heating-pipes, must be plastered two coats.

The thin partitions shown on plans shall be solid, and one and three-fourths inches thick when completed. The first coat of plaster for these must be applied on the expanded metal lath on the side opposite the studs, and before this mortar is very hard the first coat of the opposite side must be applied.

Partitions of room No. 308 shall be plastered down to the main floor all round. The stage floor will be fitted between the partitions afterward.

STUCCO AND STAFF-WORK.

Furring.

Furring under this head includes all that for columns, pilasters, beams, panels and paneled ceilings, in rooms Nos. 224, 225, 227, and the second, third and fourth story corridors.

All furring shall be done with three-fourths by three-eighths inch channels, not over 16 inches apart; it must be fastened to cross-furring with rivets or metal clips. All furring must be securely fastened in place. Wherever possible, it shall be fastened to the structural iron or the brick walls. The fire-proofing of columns comes under the head of plastering, but the second furring for finish comes under the present head.

Lathing.

Cover the furring with 27-gauge, steel, one and one-fourth inch mesh, expanded metal lath, and fasten it with No. 20 lacing wire.

Stucco-Work.

All bases, wainscoting, door and window-casings and jambs, casing around openings similar to doors, pedestals under pilasters and columns, all stair railings and stringers, and gallery railing, will be of wood or marble, unless otherwise hereinafter specified.

All other finish in first, second, third and fourth stories (including ceilings of rooms Nos. 6 and 18 of basement), such as ceiling-panels, panels in soffits of stairs and landings, beams, cornices, mouldings of wall-panels, plain pilasters and columns, moulded pilaster and column capitals and bases, all window-casings and jambs on east wall of room No. 225, that part of casings above the transoms on all doors having semi-circular heads, and the casings around ceiling-lights in fourth-story rooms—in fact, all mouldings on walls and ceilings above wainscoting or base, shall be of stucco. The ceiling in room No. 227 shall be similar to that in No. 224. All plain square columns shall have rounded angles. All columns and pilasters shall be made with an enthesis. All stucco-work must be done before the finish coat of plastering is applied. Fasten pine straight edges on the wall and ceilings, to form guides for templets.

The entire run of all mouldings or cornices between any two breaks or projections must be completed in one run. Mitres must be finished by hand.

Staff.

All ornamented mouldings, all rosettes, modillions, cartouches, columns, fluted pilasters, column and pilaster capitals; ornamented parts of ceiling-panels, the ornaments in the flutes of the pilasters and columns, and the carved ornamental keys on the semi-circular door-heads, shall be of staff. It must be cast with regard to its intended location, so that it shall fit closely and neatly. The angles, internal and external, of all ornamented mouldings must be finished with a leaf in the Renaissance style.

Cornices.

In rooms Nos. 101, 108, 112, 113, 115, 118, 119, 121, 122, 125, 127, 201, 205, 207, 208, 210, 212, 213, 215, 220, 223, 229, 235, 236, 240, 301, 302, 304, 305, 306, 307, 308, 316, 318, 322, 323, 324, 328 and 329 run stucco cornices as per scale drawings. In rooms No. 401, 405, 408, 410, 412, 413, 418, 419, 426, 430, 431, 432, and 433 run stucco cornices with plain large coves above them and a heavy moulding at the ceiling-end of coves; make a heavy moulded architrave around the ceiling-lights in these rooms, as per sheets Nos. 26 and 27.

In rooms Nos. 6 and 18, 142, 217, 224, 225, 227, 233, 310, 311, 312, 317, 331, 332, 332 1-2, 414, 415,

417, 425, and 427, and around soffits of the two main stairways and their landings, run stucco cornices with ornamented mouldings of staff, as per details.

Rosettes.

In rooms Nos. 6, 18 and 142, put up large ornamental rosettes at all electric-light outlets on ceilings.

Beams.

In rooms Nos. 101, 108, 112, 113, 115, 118, 119, 121, 122, 125, 134, 135, 136, 138, 201, 215, 220, 236, 305, 316, 318, 420, and 422 there shall be beams on ceilings, as indicated on plans; they shall have paneled soffits, and a richly ornamented modillion under each end.

The cornice-mouldings of these rooms shall mitre around the sides of these beams at their angle with the ceiling.

Panels.

In rooms Nos. 6, 18, 217, 224, 225, 227, 233, 311, 312, 331, 332, 332 1-2, 414, 415, 417, 425 and 427, and on soffits of main stairways and their landings, there shall be deep moulded panels with ornamented mouldings and richly carved rosettes in the centers, as per scale drawings and details. In rooms 224, 225, and 227, the ceiling-rosettes will have electric-light outlets projecting through them, and must be made with reference to the wiring and the bulbs.

CEMENT WORK.

All the columns and pilasters in the fourth story shall be made of Portland cement mortar. The bases of all columns which have no pedestals under them shall be made of same mortar. This work must be calcimined, so that its color will match that of stucco work.

JOINTS.

In putting up the staff-work, great care must be used to prevent the joints from showing.

SCAFFOLDING.

This Contractor shall build all the scaffolding necessary to perform all the work under his contract, and grant the use of same to other contractors for a reasonable length of time.

SPECIFICATIONS FOR ELECTRIC WORK.

SYSTEM OF WIRING.

Wiring for this building shall be done on the two-wire multiple-arc system, for an alternating current having an initial pressure, at the transformer, of 110 volts. The transformer shall be placed in room No. 22.

WIRE.

The wire shall be 98 per cent. copper, soft and pliable, covered with rubber and braid; the rubber covering must be extra heavy, of good quality, and adhere closely to the wire; the braid shall be saturated with a compound that will strengthen and protect it. No wire shall be smaller than No. 14 B. & S. gauge; all wire larger than No. 10 shall be stranded. For distributing circuits, duplex wire shall be used. Bidders shall submit, with their bids, samples of the wire they intend using; and the samples, if accepted, shall set the standard for quality for all the wiring in this building. The Architects and Board of Commissioners reserve the right to examine all wire which is to be used in the building, and to reject same if not found equal to the original samples.

Wires shall be classed as feeders, mains, sub-mains, and distributing or circuit wires. The

feeders are the wires that run from switch-boards in rooms No. 22 and 25 to centers of mains; the mains are those which carry the current from the feeders to the sub-mains on each floor; the sub-mains are those which carry the current from the mains to the centers of distribution; the distributing or circuit wires are those which extend from the mains or sub-mains to the lamps.

All wires shall be one piece in length; no joints will be allowed under any conditions. All distributing or circuit wires shall extend without a joint to the farthest lamp. Special attention must be paid to the mechanical execution of the work. Careful and neat running, connecting, soldering, taping of all wires, and securing and attachment of fittings, will be strongly insisted upon.

FEEDERS.

From the switch-board in room No. 25 extend feeders "A, C, E, G, and I" as follows:

Feeder "A" shall extend on basement-ceiling to a point under east wall of room No. 137, and continue vertically to cut-out-cabinet in room No. 137.

Feeder "C" must extend vertically to cut-out-cabinet on south wall of room No. 220.

Feeder "E" shall extend on basement ceiling to northeast corner of elevator-shaft No. 104, and from there vertically to cut-out-cabinet in room No. 219.

Feeder "G" shall extend on basement ceiling to northeast corner of elevator-shaft No. 104, and from there vertically to cut-out-cabinet in room No. 205.

Feeder "I" shall extend vertically to cut-out-cabinet in room No. 415.

From the switch-board in room No. 22, extend feeders "B, D, F, H, and J" as follows:

Feeder "B" shall extend on basement ceiling to a point under east wall in room No. 133, and then vertically to cut-out-cabinet in room No. 133.

Feeder "F" shall extend on basement ceiling to southeast corner of elevator shaft No. 130 and then up to cut-out-cabinet in room No. 239.

Feeder "D" shall extend vertically to cut-out-cabinet in room No. 236.

Feeder "H" shall extend vertically to second story ceiling and then to cut-out-cabinet in room 232 1-2.

Feeder "J" shall extend vertically to cut-out-cabinet in room No. 425.

Feeders "A, C, E, G, and I" shall supply the lights on the south half of the building only. Feeder "A" shall supply corridor lights in the first story and basement. Feeder "C" shall supply the lights in main rooms and corridors of second story and the corridors of third and fourth stories. Feeder "E" shall supply all the lights in rooms Nos. 139, 219, and 319. Feeder "G" shall supply all lights in the smaller rooms on the south end of each story. Feeder "I" shall supply the lights of the fourth story rooms.

Feeders "B, D, F, H, and J" shall supply all the lights in north half of the building. Feeder "B"

shall supply the basement and first story corridor lights. Feeder "F" shall supply all the lights in rooms Nos. 129, 239 and 335. Feeder "D" shall supply the lights in main rooms and corridors of second story and the corridors of third story. Feeder "H" shall supply the lights in the smaller rooms at north end of each story. Feeder "J" shall supply lights of fourth story rooms.

MAINS.


The feeders must be connected with the mains at the center of load. The mains, where sub-mains themselves are not used, must extend to the points from which distributing circuits ramify.

SUB-MAINS.

From the mains, extend sub-mains to the various places in the building from which distributing circuits will ramify.

DISTRIBUTING CIRCUITS.

The distributing wires shall run to the various switches and outlets. At each outlet, six inches of wire of each polarity shall be left exposed, neatly coiled and taped, ready for fixture connection. No circuit shall supply more than 12



lamps, unless these lamps are all controlled by one switch. The lamps in room No. 411 shall be suspended from a wire near the ceiling to a point near the floor. This Contractor shall supply and hang the wires from which the lamps will be suspended.

The wires for elevator lamps shall pass through the rear walls of elevator shafts at the center of course of travel, and extend to the cars through rubber tubing, hereinafter specified.

In rooms Nos. 224, 225, 227, 310, 317, 401, 403, 405, 408, 410, 412, 413, 417, 418, 419, 426, 427, 428, 429, 430, 431, 432 and 433 the ceiling lights shall be supplied from two circuits, every alternate outlet being on the same circuit. Directions will be given for locating all ceiling lights which are not located on the plans.

The twenty floor lights on the stage No. 208 shall be supplied from two circuits, every alternate lamp being on the same circuit.

CONDUIT-TUBES.

The building shall be thoroughly equipped from the source of supply to each outlet with approved iron-armored interior conduits, in such a manner as to provide continuous channels or raceways for the wires. The continuity of each tube employed for this purpose shall be such as would be required if it were to be used for conveying water or gas.

This conduit, to be approved, shall be of stand-

ard black wrought-iron pipe, encasing a non-absorbing insulating tube of a thickness equal to that of the encasing pipe. This insulating tube shall be firmly cemented to the pipe, so as to insure the exclusion of moisture from the joint between the pipe and the insulating tube.

JOINTS AND FITTINGS.

All joints shall be made with standard malleable iron couplings. Elbows shall have a radius of not less than six inches. All fittings shall conform to standards required in steam fitting.

ACCESSIBILITY.

All horizontal conduits shall be run on floors; vertical conduits shall be run in channels provided for that purpose; those for distributing circuits occurring in one and three-fourths-inch plaster partitions shall be securely laced to the expanded metal before the plastering is put on. The location, sectional division, joining, intermediate and terminal elbowing, the placing of switches, cut-outs and junction boxes, and the final emergence of the tubes beyond the finished surface at fixture-outlets, must be such that the wires shall be at all times accessible for inspection, repair or renewal.

APPLIANCES.

In order to secure safety, durability, and convenience, and to give a finished character to the

work, all appliances employed shall be such as are designed especially for use in conjunction with this system.

NUMBER OF WIRES IN CONDUITS.

Not more than one feeder, main or sub-main, shall be placed in a tube; but one tube may carry two distributing wires.

SIZE OF TUBES.

All tubes must be of sufficient size to allow the wires to be readily drawn in, withdrawn and reinserted at will.

A one-fourth-inch tube will be permitted only where space is extremely limited, as under a thin plaster-finish.

CLIPS.

Tubes, whether concealed or on the surface, must be held in place by metal "clips"; the use of staples for such purpose will not be permitted where it may be avoided.

CUT-OUT CABINETS.

This Contractor must furnish and fix in place twenty large cut-out cabinets, located where shown on plans, and as many more smaller ones as may be necessary. These cabinets shall have white Italian marble backs and sides, with wood doors and casings. The doors, with hinges and

locks, will be provided by the carpenter; but this Contractor must line the back of doors with asbestos-board, one-sixteenth of an inch thick. Wherever possible, the cabinets must finish flush with the walls. They shall be large enough to contain all distributing cut-outs, center of distribution cut-outs, and switches necessary in the various locations shown on plans. All distributing wires must enter the cabinets from the rear.

CUT-OUTS.

Every change in size of wire shall be made through a cut-out. All cut-outs shall be mounted on porcelain bases, which must be firmly fixed to back of cabinet, and arranged in a neat and systematic manner. Those not carrying over 30 amperes shall be of the plug type; those carrying more shall be of the link pattern.

SWITCHES.

The switches shall be placed where shown on plans, and where specified on lamp schedule.

All switches shall have 25 per cent. excess of carrying capacity above the current they are to control. All switches shall be double-poled, quick-break, snap switches. The switches in rooms Nos. 129, 133, 137, 139, 219, 220, 236, 239, 319, 335, 415, and 425 shall be in the same cabinet with cut-outs. Face plates for switches not

in cut-out cabinets will be furnished by hardware Contractor.

The lights illuminating the stairway adjacent to elevator-shafts Nos. 130 and 140, in each story, shall be on one switch.

Each ceiling-outlet in first-story corridor shall have one lamp controlled by special switch; these lamps shall be operated from one of the four vestibules, there being one switch in each vestibule. The switch for lamp on outlets marked "A" shall be in room No. 107. The switch for lamp on outlets marked "B" shall be in room No. 116. The switch for lamp on outlets marked "C" shall be in room No. 132; and the switch for lamp on outlets marked "D" shall be in room No. 123.

Each switch shall have a brass tag indicating what lamps it controls.

RULES.

All work performed under these specifications shall be in accordance with the rules and regulations of the National Board of Fire Underwriters, which rules are hereby made a part of these specifications.

TEST.

When the system is complete, a test shall be made by the Board of Commissioners to determine whether the system has been installed in accordance with the letter and spirit of these

specifications in all respects. If so, it will be accepted; if not, this Contractor shall remedy it at his own expense before the work will be accepted. The wires shall be of such carrying capacity that the fall of potential, when operating under conditions of maximum load, shall not be greater than 4 per cent. of the initial potential; and, under all conditions of load, the difference in potential between any two outlets shall not be greater than two per cent. of the initial potential.

The insulation resistance must be equal to, or greater than one megohm per mile of single conductor.

SWITCH-BOARD.

The Contractor shall place in room No. 22 a polished marble switch-board of suitable size to receive switches, cut-outs, and meter. Also make all connections between cut-outs, switches, and meter. There shall be a separate three-pole knife switch for each feeder.

WIRING ON INSULATORS.

Rooms Nos. 129, 139, 219, 239, 319, and 335 will have mezzanine stories, making twelve rooms in all. The wiring in these twelve rooms shall be stretched on porcelain insulators. Leave ten feet of wire at outlets in passages between the book stacks.

ELEVATOR-CABLES.

Provide and attach two one-half-inch cloth braided rubber tubes to each elevator-cab and to the wall at center of course of travel. Through these tubes run light and annunciator wires.

ELEVATOR ANNUNCIATORS.

Furnish and set one four-number annunciator in the passenger elevator-cab; and one eight-number annunciator in each freight-elevator, with pushes at each floor and connections for same—design and finish to be as directed. Also provide battery for same.

All annunciator or bell wires must be placed within conduits; and such of the foregoing rules and regulations as are applicable to rendering them accessible, and affording suitable protection, shall be followed.

LAMP SCHEDULE.

On the drawings, the small circles enclosing figures indicate the outlets for electric light, while the figures themselves designate the number of lamps to each outlet. The diamonds indicate the position of switches, and the figures inside, the number of switches. All lamps shall be 16 candle-power, excepting those in rooms Nos. 224 and 411, which shall be 32 candle-power.

LAMP SCHEDULE.

Location. Room Number.	Total Lamps.	Total Outlets.	Ceiling Outlets.	Lamps Each.	Bracket Outlets.	Lamps Each.	Switches.	
								<i>The following Lamps shall be taken from Feeder "A."</i>
4	9	3	3	3	....	...	1	Switch in room number 137.
6	5	1	1	5	....	...	1	" " " " 137.
106	5	1	1	5	....	...	} 1	" " " " 137.
107	5	1	1	5	....	...
116	20	4	....	....	4	5	1	" " " " 137.
117	15	3	3	5	....	...	1	" " " " 137.
132	5	1	1	5	....	...	1	" " " " 137.
136	6	2	2	3	....	...	} 1	" " " " 137.
138	9	3	3	3	....	...
137	3	1	1	3	....	...	1	" " " " 137.
141	10	2	....	....	2	5	} 1	" " " " 137.
142	67	14	8	5	6	3		
142	3	3	3	1	....	...	1	" " " " 107.
142	6	6	6	1	....	...	1	" " " " 132.
Entrances	36	6	....	....	6	6	3	" " " " 137.
Total...	204	51	33	....	18	....	14	
<i>Lamps on Feeder "B."</i>								
17	9	3	3	3	....	...	1	Switch in room number 133.
18	5	1	1	5	....	...	1	" " " " 133.
123	5	1	1	5	....	...	} 1	" " " " 133.
124	5	1	1	5	....	...
131	10	2	....	....	2	5	....	On Switch with Lamps in 142.
133	3	1	1	3	....	...	1	Switch in room number 133.
134	9	3	3	3	....	...	} 1	" " " " 133.
135	6	2	2	3	....	...
142	65	14	8	5	6	3	1	" " " " 133.
142	4	4	4	1	....	...	1	" " " " 116.
142	3	3	3	1	....	...	1	" " " " 123.
Entrances	48	8	....	....	8	6	3	" " " " 133.
Total...	172	43	27	....	16	....	11	

LAMP SCHEDULE—Continued.

Location. Room Number.	Total Lamps.	Total Outlets.	Ceiling Outlets.	Lamps Each.	Bracket Outlets.	Lamps Each.	Switches.	The following Lamps shall be taken from Feeder "C."
104	3	1	....	....	1	3	1	Switches in elevator cab.
205	2	1	1	2	....	....	} 1	Switch in room number 220.
217	20	4	4	5	....	....
218	10	2	....	....	2	5	} 1	" " " " " " 220.
220	6	2	2	3	....	....
223	3	1	1	1	3	....	1	" " " " " " 220.
224	15	15	15	1	....	....	2	" " " " " " 220.
225	200	40	30	5	10	5	3	" " " " " " 220.
305	3	1	1	3	....	....	} 1	" " " " " " 220.
311	10	2	2	5	....	....
312	10	2	2	5	....	....	} 1	" " " " " " 220.
313	10	2	2	5	....	....
316	6	2	2	3	....	....	1	" " " " " " 220.
316½	1	1	....	....	1	1	....	" " " " " " 220.
317	70	62	60	1	2	2	3	" " " " " " 220.
411	14	14	14	5	....	....	1	" " " " " " 220.
414	20	4	4	5	....	....	} 1	" " " " " " 220.
415	5	1	1	5	....	....
425	5	1	1	5	....	....	1	
Total...	469	158	142	....	16	....	16	
<hr/>								
<i>Lamps on Feeder "D."</i>								
227	39	39	39	1	....	....	2	Switch in room number 236.
233	10	2	2	5	....	....	} 1	" " " " " " 236.
234	10	2	....	....	2	5		
235	3	1	1	3	....	....	1	" " " " " " 236.
236	6	2	2	3	....	....	1	" " " " " " 236.
318	6	2	2	3	....	....	1	" " " " " " 236.
318½	1	1	....	....	1	1	....	....
331	5	1	1	5	....	....	} 1	Switch in room number 236.
332	10	2	2	5	....	....
332½	5	1	....	....	1	5	} 1	
333	10	2	....	....	2	5		
Total...	105	55	49	....	6	....	7	
<hr/>								
<i>Lamps on Feeder "E."</i>								
Stairways.	6	6	....	....	6	1	1	Switch in room number 219.
140	3	1	....	....	1	3	1	" " " " " " 140.
139	84	84	84	1	....	....	10	" " " " " " 219.
219	84	84	84	1	....	....	10	" " " " " " 219.
319	84	84	84	1	....	....	10	" " " " " " 219.
Total...	261	259	252	....	7	....	32	

LAMP SCHEDULE—Continued.

Location. Room Number.	Total Lamps.	Total Outlets.	Ceiling Outlets.	Lamps Each.	Bracket Outlets.	Lamps Each.	Switches.	The following Lamps shall be taken from Feeder "F."
Stairways.	6	6	...	...	6	1	1	Switch in room number 239.
130	3	1	...	...	1	3	1	" " " " 130.
129	84	84	84	1	...	...	10	" " " " 239.
239	84	84	84	1	...	...	10	" " " " 239.
335	84	84	84	1	...	...	10	" " " " 239.
Total...	261	259	252	...	7	...	32	
Lamps on Feeder "G."								
1	6	2	2	3	...	...	1	Switch in room number 1.
2	15	5	5	3	...	...	1	" " " " 2.
3	15	5	5	3	...	...	1	" " " " 3.
5	1	1	...	...	1	1	...	...
7	1	1	...	...	1	1	...	...
8	30	10	10	3	...	...	2	Switch in room number 8.
9	1	1	...	...	1	1	...	...
10	6	2	2	3	...	...	1	Switch in room number 10.
11	1	1	...	...	1	1	...	...
12	1	1	...	...	1	1	...	...
13	25	25	...	...	25	1	...	...
14	1	1	...	...	1	1	...	...
15	24	8	8	3	...	...	3	Switch in room number 15.
25	1	1	...	...	1	1	...	...
101	28	6	5	5	...	...	2	Switch in room number 101.
105	1	1	1	3	1	1	...	...
108	8	2	1	5	...	...	1	Switch in room number 108.
109	1	1	...	...	1	1	...	...
110	2	1	1	2	...	...	1	Switch in room number 110.
111	1	1	...	...	1	1	...	...
112	18	6	6	3	...	...	2	Switch in room number 112.
113	18	6	6	3	...	...	2	" " " " 113.
115	15	3	3	5	...	...	1	" " " " 115.
201	29	9	5	5	4	1	2	" " " " 201.
207	7	3	2	3	1	1	1	" " " " 207.
208	2	1	1	2	...	...	1	" " " " 208.
209	1	1	...	...	1	1	...	...
211	2	1	1	2	...	...	1	Switch in room number 211.
212	7	3	1	5	2	1	1	" " " " 212.
213	8	4	2	3	2	1	1	" " " " 213.
214	1	1	...	...	1	1	...	...
215	3	1	1	3	...	...	1	Switch in room number 215.
216	1	1	...	...	1	1	...	...
301	10	2	2	5	...	...	1	Switch in room number 301.
302	10	2	2	5	...	...	1	" " " " 302.
304	3	1	1	3	...	...	1	" " " " 304.
306	3	1	1	3	...	...	1	" " " " 306.
307	10	2	2	5	...	...	1	" " " " 307.
308	26	22	*20	1	2	3	3	" " " " 309.
309	1	1	...	...	1	1	...	...
310	90	90	90	1	...	...	4	Switch in room number 309.
Total...	434	237	187	...	50	...	38	

* At floor.

LAMP SCHEDULE—Continued.

Location. Room Number.	Total Lamps.	Total Outlets.	Ceiling Outlets.	Lamps Each.	Bracket Outlets.	Lamps Each.	Switches.	
<i>The following Lamps shall be taken from Feeder "H."</i>								
15	24	8	8	3	....	....	3	Switch in room number 15.
16	39	13	13	3	....	....	3	16.
17	36	12	12	3	....	....	2	17.
19	6	2	2	3	....	....	1	19.
20	1	1	....	....	1	1	....	.....
21	1	1	....	....	1	1	....	.....
22	1	1	....	....	1	1	....	.....
23	1	1	....	....	1	1	....	.....
118	15	3	3	5	....	....	1	Switch in room number 118.
119	18	6	6	3	....	....	2	119.
121	25	5	5	5	....	....	2	121.
122	8	2	1	3	....	....	1	122.
125	8	2	1	3	....	....	1	125.
127	20	4	4	5	....	....	2	127.
229	12	4	2	5	2	1	1	229.
230	3	1	1	3	....	....	1	230.
231	3	1	1	3	....	....	1	231.
232	3	1	1	3	....	....	1	232.
232½	3	1	1	3	....	....	1	232½.
240	23	7	4	5	3	1	1	240.
322	10	2	2	5	....	....	1	322.
323	6	2	2	3	....	....	1	323.
324	10	2	2	5	....	....	1	324.
326	1	1	....	....	1	1	....	.....
328	10	2	2	5	....	....	1	328.
329	25	5	5	5	....	....	2	329.
Total...	312	90	80	....	10	....	21	
<i>Lamps on Feeder "I."</i>								
401	26	26	26	1	....	....	2	Switch in room number 415.
403	12	12	12	1	....	....	2	415.
404	1	1	....	....	1	1	....	415.
405	30	30	30	1	....	....	2	415.
408	32	32	32	1	....	....	2	415.
412	32	32	32	1	....	....	2	415.
417	50	50	50	1	....	....	2	415.
418	60	60	60	1	....	....	4	415.
419	40	40	40	1	....	....	2	415.
420	4	2	2	2	....	....	1	420.
422	4	2	2	2	....	....	1	422.
423	4	1	1	4	....	....	1	423.
424	5	1	1	5	....	....	1	424.
424½	1	1	....	....	1	1	....	.....
Total...	301	290	288	....	2	....	22	

LAMP SCHEDULE—Continued.

Location. Room Number.	Total Lamps.	Total Outlets.	Ceiling Outlets.	Lamps Each.	Bracket Outlets.	Lamps Each.	Switches.	<i>The following Lamps shall be taken from Feeder "J."</i>			
410	80	80	80	1	....	....	2	Switch in room number	425.		
413	45	45	45	1	....	....	2	" " " "	425.		
426	32	32	32	1	....	....	2	" " " "	425.		
427	50	50	50	1	....	....	2	" " " "	425.		
428	40	40	40	1	....	....	2	" " " "	425.		
429	60	60	60	1	....	....	4	" " " "	425.		
430	26	26	26	1	....	....	2	" " " "	425.		
431	12	12	12	1	....	....	2	" " " "	425.		
432	30	30	30	1	....	....	2	" " " "	425.		
433	32	32	32	1	....	....	2	" " " "	425.		
434	1	1	....	....	1	1	....	" " " "	425.		
Total...	408	408	407	....	1	....	22				

Total Lamps.	Total Outlets.	Ceiling Outlets.	Bracket Outlets.	Switches.	
204	51	33	18	14	Total on Feeder A.
172	43	27	16	11	" " " " B.
469	158	142	16	16	" " " " C.
105	55	49	6	7	" " " " D.
261	259	252	7	32	" " " " E.
261	259	252	7	32	" " " " F.
434	237	187	50	38	" " " " G.
312	90	80	10	21	" " " " H.
301	290	288	2	22	" " " " I.
408	408	407	1	22	" " " " J.
2,927	1,850	1,717	133	215	In building.

TELEPHONE WIRES.

The building shall be wired for a complete independent system of private telephones, as hereinafter described. There shall be telephone connection between each and all of the following rooms: Nos 3, 8, 13, 101, 108, 112, 113, 115, 118, 119, 121, 122, 125, 127, 129, 139, 201, 207, 212, 213, 219, 220, 227, 229, 236, 239, 240, 301, 302, 307, 310, 319, 322, 323, 324, 328, 329, 335, and 423. Rooms Nos. 129, 139, 219, 239, 319, and 335 will have mezzanine floors; thus there will be two telephones for each of these rooms. The system shall be a metallic circuit system. Each station shall have independent connection with all the other stations of the system. This Contractor need not furnish the telephones or batteries, but he shall extend the wires to room No. 11, where the batteries will be located. The wires shall not be smaller than No. 18 B. & S. gauge. In all other respects they shall correspond with the electric-light wires.

In addition to this system, there shall be a system of battery circuits for the telephone call bells which shall correspond in all respects with the telephone circuit.

CALL BELL.

In room No. 212 put up an electric call bell with push button in room No. 213. Connect them with each other and with a battery, which must be provided for same and located in the nearest closet.

SPECIFICATIONS FOR HEATING AND VENTILATING.

GENERAL.

All excavating necessary for the introduction of the fan-system of mechanical heating and ventilating for the building shall be done by the mason Contractor. All work in these specifications or shown on the drawings is to be executed in a thorough, substantial and workmanlike manner.

All work and material, in all cases, must be of the best description, unless otherwise specified. Work on the drawings is intended to be accurate, according to the scale on which the drawings are made; but the figured-dimensions and detail drawings are in all cases to be followed, though they may differ from scale-measure on general drawings. The Contractor is to give his general superintendence to the work, obtain all official licenses for temporary obstructions, enclosures, &c., and be responsible for any accident from either contract or extra work.

The building is to be heated and ventilated, throughout, by direct radiation and a fan-system. All material used in the construction of this apparatus shall be new and of the best quality, each of their respective kinds, and the work shall be performed by skilled workmen.

Whatever work may be shown by the plans or

included in these specifications, or fairly implied by either or both, is to be considered included in this contract.

Every precaution must be taken to make the system of piping absolutely tight; and after all work has been connected and completed, a test, of as long duration as may be required by the Architects, shall be made with the steam at 75 pounds pressure per square inch, without displacing, straining, or causing any portion of the apparatus to leak.

All apparatus is to be so arranged as to give a constant supply of fresh air to all of the rooms with which the indirect system is connected. The supply of fresh air is to be constant under all hydrometric, barometric, and thermal conditions of the outside air.

The temperature of all the rooms is to be controlled by Johnson Heat Regulating System, or others of equal merits.

The apparatus shall consist of fans, engines, heating coils, radiators, return water apparatus, galvanized-iron air-ducts, with all the necessary cut-off dampers, registers and register-faces.

The rooms shall be furnished as follows:

First Story.

Room No.	Cubic Feet of Air per minute.	Room No.	Cubic Feet of Air per minute.
101	600	127	300
108	150	129	360
112	600	129½	360
113	650	134	120
115	450	135	120
118	450	136	120
119	600	138	120
121	600	139	360
122	150	139½	360
125	150	142	3,000

Second Story.

Room No.	Cubic Feet of Air per minute.	Room No.	Cubic Feet of Air per minute.
201	300	224	600
207	120	225	7,500
208	60	227	1,200
212	150	228	120
213	180	239	360
215	100	239½	360
219	360	240	210
219½	360		

Third Story.

Room No.	Cubic Feet of Air per minute.	Room No.	Cubic Feet of Air per minute.
301	240	322	240
302	240	323	180
304	50	324	240
306	90	328	240
307	360	329	600
310	6,600	335	360
319	360	335½	360
319½	360		

Fourth Story.

Room No.	Cubic Feet of Air per minute.	Room No.	Cubic Feet of Air per minute.
401	360	422	100
405	360	423	90
408	360	424	120
410	600	426	300
412	300	428	360
413	300	429	1,500
418	1,500	430	360
419	360	432	360
420	90	433	360

Test-sheet, showing the above air-delivery in each of the above rooms in this building, shall be furnished by this Contractor.

The above quantities of air will be required for all the rooms before final payment is made.

All galvanized-iron air-ducts and brick flues must be put in according to plans. All connections to the base of the flues and to the hot-air chamber shall be made in a satisfactory manner.

The apparatus shall be of sufficient capacity to heat all the rooms in the building to 72 degrees in the coldest weather, excepting the toilet-rooms and corridors, which are to be heated to 65 degrees.

PUMP AND RECEIVER.

Furnish, place and connect where directed, in engine-room, one, style No. 2, size D, Knowles receiver, with two automatic Duplex pumps—all to be set on one substantial brick and stone foundation, with a 5-inch cut-stone cap anchored into

place. Pumps to have 10-inch-diameter steam-cylinders, four-inch-diameter water-cylinders, and 12-inch stroke. Provide each pump with all necessary trimmings, including two one-pint Detroit lubricators. Connect the returns from the heating system to the receiving tank. Connect the discharge from the pumps to return-pipe in tunnel at curb at the north end of building, and provide all the necessary checks and hand-valves.

Cross-connect both pumps so that either can be used at will. Provide an equalizing pipe between heating-mains and the top of receiver. Take live steam-connection for pumps from header.

HOT-WATER TANK.

Furnish and set up in room No. 11, on brick piers with stone saddles, one hot-water tank, 36 inches diameter, six feet long, made of five-sixteenths-inch steel, well riveted and braced, to stand one hundred pounds pressure, and with proper hand-holes as directed.

In this tank place a coil of two-inch, extra heavy, galvanized-iron pipe, containing one square foot of heating-surface for each 15 gallons of water in tank. Make proper connections, so that either live-steam or exhaust can be used for heating the water, and connect return to trap; the trap shall discharge into top of receiver and to catch-basin. Leave proper outlets for plumbers' connections, and run one and one-half-inch blow-off to catch-basin. Make by-pass around trap, so that same can be removed without interfering with the water-heating.

CATCH-BASIN.

Furnish, and connect to sewer, in engine-room, a cast-iron catch-basin, 30 inches in diameter by four feet in depth, with suitable trap-pipe, also a cover bolted on, and provided with a manhole trap-pipe. Run a three-inch vapor-pipe from same above roof, and provide this with Lyman("A" exhaust head with drip; run where directed.

Connect drips from pumps, engines, and grease-catchers to catch-basin in proper manner. Run pipe from bottom of receiving-tank to catch-basin provided by plumbing Contractor.

BLOWERS.

Furnish, and place in position, where shown on plans, two of Sturtevant & Co.'s blast wheels, or their equals, subject to approval by the Architects. The size of wheels shall be six feet in diameter by three and one-half feet in width, as shown on sheet No. 14. Each wheel shall be incased in three-quarter steel-plate housing. The blast wheels shall be built of T steel securely cast into heavy cast-iron hubs, the hubs being carefully bored and splined to fit the shafts. The floats and side-plates shall be built of a good quality soft steel. The floats shall be curved to their proper curvature to prevent the whistling of the air. Both housings shall be built with horizontal top discharge, and open on one side for free inlet of air. The housing shall be built of heavy sheet-iron, thoroughly braced with steel T's and angles, as

shown. The blowers shall have heavy steel shafts extending through blast-wheels, and have self-adjusting pivot-bearing boxes; the boxes shall be self-oiling, and have a large oil-cellar with bristle-brushes, for conducting the oil to the shafts.

ENGINES.

Furnish, and place in position where shown on plans, two B. F. Sturtevant Low Pressure Engines, or others of equal merit, subject to approval by the Architects. These engines shall be arranged for direct connection to the fan shafts. The engines shall have cylinders not less than ten inches in diameter, by eight-inch stroke. All boxes shall be babbitted with first-quality babbitt-metal, or constructed of brass where they come in contact with the journal, and to be carefully rimmed to sides. Valves shall be balanced and accurately fitted, cylinder-heads shall have ground joints with cylinders. Provide two one-pint sight-feed cylinder-lubricators, all necessary sight-feed oil-cups for bearings, and all the necessary wrenches, full set of anchor-bolts and plates for engines. Engines shall be provided with heavy cast-iron bases, in addition to the frame of the engines.

HEATING-COILS.

Furnish and place on raised platforms, in front of the outlet of the fans, where shown on plans, heating-coils containing not less than 11,200 lin-

real feet of one-inch pipe, divided in four groups; and each group divided in four different parts, connected so that one, two, three, or four of the parts can be used at one time.

Furnish and place on a raised platform in front of the fan inlet, where shown on plans, tempering coils containing not less than 2,712 lineal feet of one-inch pipe.

These coils shall be built of one-inch steel pipe, screwed into heavy cast-iron bases, these bases to be of special construction so as to secure perfect circulation. The bases shall be provided with a diaphragm separating the steam inlet from the drip. Each pipe is to start on the inlet-side, have a horizontal connection at the top, put in with right and left elbows, the return entering the base at the opposite side. Diaphragms are to be so arranged that the inlet and drip will come on the same side of coil. The heaters shall be constructed on independent sectional bases, consisting of cast-iron sections with corrugated sides, so arranged that the projections on one section fit the depressions on the adjacent section. The interior shall be formed in three portions, the two upper portions being separated by a diaphragm, and connected by vertical and cross steel pipes, securely screwed into the section and elbows. Pipes shall be of steel weighing not less than 1.66 pounds per running foot of one-inch-pipe. The aforesaid cored space in the heater to connect to and form a part of a hollow cylindrical head, the upper part of which acts as a steam-supply reservoir—the lower part of said head forming a drip reservoir,

and being connected direct with the cored space in the bottom of the section through which the water of condensation is removed.

The sides of this inlet and drip-head to be carefully finished, and provided with suitable gaskets, so that these sections can be made up in groups and held together by through bolts,—the steam being admitted, and the drip removed through a flange or header at either end of the group, tapped for proper size of pipes. Each one of these sections shall be tested to a 150-pound hydraulic pressure before leaving the works. The heater shall be provided with a complete wrought angle-iron foundation frame, one end of each section to rest on an iron ball, to allow for expansion and contraction.

Around the sides, top, and between the sections, there will be constructed a steel-plate jacket, stiffened at the corners with angle-iron, completely enclosing space between heater and fan with which it connects. The heating coils shall be of the B. F. Sturtevant Co.'s manufacture or their equal, subject to approval.

PLATFORMS.

Platforms will be furnished by other contractors, of sufficient height to bring the coils near the ceiling. These platforms will not have less than three feet in the clear underneath them.

The raised platforms must be constructed of steel beams resting on brick piers, and covered with one and three-fourths-inch matched flooring.

Platforms shall be built in a neat and workman-like manner, to give a free passage of air underneath them.

Platforms for tempering coils are each to be provided with a large pivoted swinging damper, constructed of seven-eighths-inch matched flooring, put in free so that they can be handled by the Heat Regulating system.

The heating and ventilating Contractor will cover the top of these platforms with No. 26 galvanized iron.

TEMPERING-CHAMBER DAMPERS.

The dampers under tempering coils shall be controlled by the Heat Regulating System, so arranged that the dampers will open and let in cold air, when the temperature in the tempered air-chamber rises above 50 degrees, thereby keeping the temperature down to 50 or 60 degrees, as desired, at all times. The coils shall also be controlled by a second thermostat cutting the steam off from the coils, should the opening of the dampers not be sufficient to keep the temperature down to the desired degree.

HOT AIR CHAMBERS.

Around the coils in front of the fans there will be constructed chambers, the walls of which will be 12 inches thick, of brick, laid in cement mortar, so as to make a perfectly tight work. These brick chambers will be furnished by the mason

Contractor, also the brick partitions around the tempering-coils and blowers. The chamber walls shall be built after the coils and blowers are set in position.

The carpenter Contractor will furnish all the necessary doors for entering the blower-rooms and heater-rooms and for entering the heater-room proper between the blower and the coils, and also into the space beyond the coils.

The heating and ventilating Contractor will close up all openings around the coils with galvanized iron. The mason Contractor will provide for fresh air-inlet into the space in front of the tempering-coils.

CONTROL OF HOT-AIR CHAMBER.

Between the outlet of the fans and the space under the reheating coils there shall be placed Noble's Patent dampers, so that the ventilation will be cut off, when only hot air is needed for heating up the building.

The coils in front of the fans shall be controlled by four thermostats placed in the cold-air chamber, and so arranged for different temperatures, that the amount of heating-coils in use in the hot-air chamber always will be in proportion to the outside temperature.

The whole shall be so arranged that, at an outside temperature of 60 degrees, only the exhaust steam is carried to the heating-coils, and at 72 degrees outside temperature the exhaust steam is entirely cut off and thrown outside automatically.

STEAM CONNECTIONS.

The steam supply shall be taken from the inside of basement wall below the north entrance, the steam supply and return will be brought to this point from the University boiler plant.

Furnish and properly support in place, where directed, a high-pressure steam header made of 12-inch, standard size, wrought-iron pipe. Provide this header with all the necessary T's for the attachment of pipes, as hereafter specified. Also provide two plug openings for possible future requirements. From the 12-inch high-pressure header run an independent pipe for supplying the engines, four inches in diameter; place in the four-inch-pipe in engine-room a T; run a three-inch pipe from the T for supplying each engine. Place in each three-inch pipe near the engine a globe-valve. Place in the 4-inch pipe near the high-pressure header a four-inch gate-valve.

Starting from the 12-inch high-pressure header, run a two and one-half inch pipe for supplying the pumps. Place in this pipe a two and one-half inch gate-valve near the high-pressure header, also one and one-half inch valves at the pumps.

Where pipes are reduced, eccentric fittings must be used; this holds good for all piping.

The Contractor shall submit to the Architects, for their approval, complete drawings of all the pipes and valves in the building, before commencing the work.

LOW-PRESSURE HEADER.

Furnish and properly support in place a low-pressure steam header made of 12-inch, standard size, wrought-iron pipe. This header shall be located at some convenient point near the fan-room, as may be directed. Connect this header to the high-pressure main with a six-inch pipe, place in the six-inch pipe at the point near the low pressure-header a five-inch G. M. Davis, No. 4, reducing pressure valve close to where it connects to the low-pressure header, arranged with valves, bypass and flanges so that the reducing pressure-valve can be removed for repairs, cleaning, etc., without interfering with the heating of the building. Place a low-pressure steam-gauge on the low-pressure header, close to the regulating valve, and in a position where the engineer can easily see it. The steam for heating the building shall be taken from this low-pressure header.

Starting from the twelve-inch low-pressure header, run a seven-inch main for supplying the heating coils. At a point near the low-pressure header place in this seven-inch pipe a gate-valve of the Jenkins Bros.' Diamond Brand; supply each of the two groups in front of each fan with a four-inch pipe. Supply each of the tempering coils through a three-inch pipe. Each group of coils in front of the fans shall be divided into four sections, so that parts of the coils can be cut off at any time. Connect the sections on each side of the blank flanges through separate pipes, and run separate pipes from each section of the coils, and

connect them with the return-pipe. Connect the return-pipe with the receiving tank. Place gate-valves in all the returns. The three-groups of tempering coils shall each have one supply and one drip pipe. At a point near the receiving tank, seal all the returns.

Starting from the twelve-inch low-pressure header, run pipes along the ceiling of basement for supplying the direct radiation.

The foot of the conductors for the rain-water shall be supplied with steam in proper manner.

EXHAUST-STEAM HEADER.

Furnish and erect in place, where directed, an exhaust-steam header made of twelve-inch, standard size, wrought-iron pipe. The several exhaust-pipes from pumps and engines are to be connected into this header.

The two three and one-half-inch exhausts from blower-engines shall be connected into one six-inch pipe, provided with a six-inch Hine eliminator, and then be connected to the exhaust-header. The two two-inch exhausts from the pumps shall be connected into one two and one-half-inch pipe, provided with a two and one-half-inch Hine eliminator and then connected to the exhaust header. All shall be provided with the proper valves and fittings and put up as directed. Each exhaust pipe shall be furnished with a straight-way-valve, located close to the point of connection with the header. From the lowest point of the header, run a one and one-fourth-inch relief pipe, discharging

into blow-off basin. From the exhaust-steam header above specified, run a main exhaust-pipe of five-inch, standard size, wrought-iron pipe by the most direct course to the tempering coils. Run from the twelve-inch low-pressure header a four-inch pipe, making connections with the twelve-inch exhaust header; place in this four-inch pipe a gate-valve. Run from the twelve-inch exhaust-header a five-inch pipe, by the most direct course, to a point about five feet above the roof of the building, and provide same with a five-inch "Lyman" A. exhaust-head, with drip-run where directed. Place in the five-inch pipe, near the exhaust header, a five-inch McGowan back-pressure valve, by the use of which the pumps and engines may be relieved of back-pressure, when the exhaust-steam is not being utilized in the heating coils. Run from the foot of this pipe a one and one-fourth-inch drip-pipe, discharging into the blow-off basin.

SPRAY-CHAMBER AND DRYING-TUBES.

Furnish and erect a spray-chamber, as shown; construct same of No. 18 galvanized iron, walls and ceiling, with concrete bottom, laid with Portland cement. This chamber must be made tight, with drain to catch-basin. Drain connection shall be four inches. Provide the spray-chamber with iron doors and frames, closing water-tight, with rubber gaskets. The spray-chamber shall be provided with 36 spray-heads, delivering 144 gallons of water per minute with twenty pounds pressure.

Furnish a system of drying-tubes, consisting of 56 tubes, fourteen inches in diameter, at one end, and sixteen inches at the other. These tubes shall be about ten feet long, and built of No. 20 galvanized iron, with spiral around the inside. The tubes shall be set in tube-sheets, made water-tight. The tubes shall be perforated in the bottom, and the floor under the tubes shall drain back to the spray-chamber.

All shall be made according to patent controlled by Foss and Noble of Chicago.

VALVES.

All valves used in the construction of this work are to be angle or straight-way valves, and all to be of Jenkin Bros.' Diamond Brand or other of equal merit. Radiators are to be furnished with valves of the best steam metal, nickel-plated all over, with hard wooden handles.

AIR-VALVES.

Each radiator and coil is to be provided with Marsh's Acme No. 6 automatic air-valve; and at any point in the low-pressure mains, where it will be necessary to secure rapid and perfect circulation of steam, place air-valves.

PIPE-COVERING.

Cover with magnesia sectional covering all steam mains, returns, exhausts, hot-water heaters, risers and branches. Covering shall contain at least 85 per cent. magnesia.

PIPE-HANGERS.

All steam-pipes running near ceiling shall be suspended from ceiling with substantial wrought-iron-hangers, securely fastened to beams. These hangers shall be placed not over ten feet apart.

DIRECT RADIATION.

The steam mains shall be taken from low-pressure header, as before specified, and be run with a gradual descent, in the direction of the flow of the steam, until all risers and connections have been supplied, then back again to the receiver—making what is known as the one-pipe or circulating system. The steam mains, risers, returns, and connections shall be of the proper sizes, as shall be directed; where steam mains are reduced, eccentric fittings must be used.

All risers and connections for first-story radiators are to be fitted with gate or angle-valves where they are taken off the mains. The ends of circuit must be dripped and carried below water-line of receiver. Each branch of heating mains, and its corresponding return, shall be provided with valves, so that any section can be shut off independently of the others.

Proper care must be taken to allow for expansion and contraction of steam mains and risers; for this purpose supply connections will be taken out of top mains; then nipple, elbow, and branch to radiators or risers. These connections shall not be less than two and one-half feet long, and none

of them shall be less than one and one-half inches in diameter, and so arranged that the expansion of the risers will not affect the radiation. All connections from radiators to risers shall not be less than two and one-half feet, nor more than four feet, in length, and shall be one size larger pipe than the valves or radiators call for, to allow the water of condensation to flow easily back through connection to risers, and so arranged that the expansion of risers will not affect the radiation.

Connect the system of direct radiation for heating the rooms in the building as follows:

First Story.

Room No.	Square Feet.	Room No.	Square Feet.
101	240	125	96
107	80	127	234
108	66	129	480
112	270	129½	480
113	108	132	120
115	120	134	40
116	140	135	60
118	120	136	60
119	108	138	40
121	360	139	480
122	96	139½	480
123	100	142	875

Second Story.

Room No.	Square Feet.	Room No.	Square Feet.
201	246	224	410
207	108	225	1,464
212	60	227	504
213	168	229	156
215	60	239	600
219	600	239½	600
219½	600	240	264

Third Story.

Room No.	Square Feet.	Room No.	Square Feet.
301	144	322	156
302	60	323	66
306	36	324	108
307	72	328	66
310	336	329	360
319	600	335	600
319½	600	335½	600

Fourth Story.

Room No.	Square Feet.	Room No.	Square Feet.
401	300	423	60
405	216	424	120
408	300	425	60
410	504	428	384
415	60	429	600
418	600	430	360
419	384	432	300
420	60	433	360
422	60		

All the radiators to be of Ringen's "Louis XIV" radiators or their equals as may be selected; those in front of windows must be lower than the window stools, and all others not more than 39 inches high.

The following shall govern the sizes of radiator valves:

50 feet or less shall have one and one-fourth-inch valve.

50 feet to 80 feet shall have one and one half-inch valve.

80 feet or over shall have two-inch valve.

PROTECTING WOOD-WORK.

Steam-pipes shall not be allowed to come in contact with wood-work; where wood is near, it shall be protected with galvanized iron; where pipes pass through floors or partitions, they shall be insulated with Vosburgh cast-iron thimbles, or others, as directed, of one-inch larger diameter than the pipe, said thimbles to extend through partitions and floors to ceiling, and be provided with neat cast-iron floor and ceiling plates.

CUTTING AND REPAIRING.

This Contractor shall do all cutting of holes in masonry walls and floors, necessarily to execute this work, and shall patch up around pipes, so as to leave the building in good shape.

PAINTING.

All mains, risers, and direct radiators in finished part of building shall be neatly painted with Japan paint and bronzed as may be directed; all other pipes and fixtures which are part of this contract shall be painted two good coats of asphalt varnish.

GALVANIZED IRON.

The galvanized iron air-ducts for hot-air and ventilation shall be run as shown on plans—horizontal-ducts in basement, and vertical ducts, to be of No. 24 and No. 22 iron, as directed. These pipes shall be run on easy sweeps. Pipes shall be built rectangular in section, and of sizes marked, with double lap-seams well hammered down. The

lap-joints shall be put together with reference to the easy flow of air. Each supply-pipe to the different rooms shall be automatically controlled by the Johnson Heat Regulating system. Place in all the pipes and branches cut-off dampers at the base of the flues, or at some point near the hot-air chamber, as may be directed. Connect the several batteries of ventilating flues that terminate above third-story ceiling with the chimneys built, as shown by the mason. All pipes shall be properly supported, and properly connected to the vertical flues, in such a manner as to be permanently tight. Build, where shown on plans, two dust-chutes of galvanized iron No. 20, and provide same with iron doors on every floor, as directed.

REGISTERS AND SCREENS.

Furnish, and place over all hot-air openings, in the rooms that are controlled by the Heat Regulating System, ornamental screens; and over all vent openings, in the same rooms, registers with valves. These valves shall be of the Noble's Patent, so arranged as to close automatically at any time from lack of pressure in the rooms, or from backward currents.

All registers shall be of the size called for on the plans, or as directed.

Each room is to be provided with a ventilator opening, with registers placed eight inches above the floor-line.

Screens shall be made of wrought-iron, from special designs furnished by the Architects. Reg-

isters shall be of Tuttle & Bailey's make, or others of equal merit, of patterns to be selected. Screens and registers shall be japanned as directed.

BOLTS, ETC.

All bolts, rods, and everything necessary for securing the engines, pumps, blowers, &c., to their respective foundations, must be furnished by the heating and ventilating Contractor.

WIRE SCREENS.

Furnish, and place in fresh-air-inlets, copper-wire screens 40th part of an inch mesh. These screens shall be made in sections, so that they can be removed for cleaning.

HEAT REGULATING.

The Johnson Heat Regulating system, or others of equal merits, subject to approval by the Architects, must be furnished complete, in running order, with connections for controlling the tempering-chamber, the hot-air chamber, and the dampers and radiators for all the rooms in the building, with adjustments made on the thermostats regulating the rooms to within one degree.

MATERIAL AND WORKMANSHIP.

All materials used in the construction of this heating and ventilating apparatus must be of the best quality of their respective kinds; and all la-

bor shall be performed by skilled mechanics, under the immediate supervision of this Contractor. This Contractor shall furnish all material not expressly mentioned in these specifications as left out, which may be required for the fullest completion of the plan. Directions will be given from time to time, as the work progresses, which this Contractor shall carry out according to the true meaning and intention of the plans and specifications; and should any dispute arise as to what is shown in the drawings, or called for in the specifications, the Architects shall decide, what they mean to express.

GUARANTEE.

The whole apparatus shall be guaranteed to be first-class in material and in workmanship, to heat the rooms to the above specified temperatures, and to supply the rooms with the different quantities of air specified.

This work will not be accepted until the guarantees herein mentioned have been met during a temperature of 10 degrees below zero. This Contractor shall furnish a bond, binding him to a satisfactory fulfillment of the above conditions.

The specifications are to be considered as minimum requirements; the Contractor must, at his own expense, add increased radiation, if he considers it necessary in fulfilling the conditions.

